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Selecting a House-Heating Boiler

By Frank L. Busey

The size of the boiler to be used for heating a residence has been discussed until it is threadbare, but I recently had a case under consideration that brought the question again to mind. To be sure, it is disastrous to install a boiler that is too small, but for the man who pays the coal bills it is also bad practice to select a boiler too large for the job.

Several facts are well established concerning small sectional cast-iron boilers. The majority of them will give an efficiency around 50 per cent when burning from 4 to 10 lb. of coal per sq. ft. of grate per hour. The smaller ones may range from 4 to 8 lb. and the larger ones from 6 to 10 lb. for the above mentioned 50 per cent efficiency. A boiler should be able to carry its rated capacity on from 6 to 8 lb. of coal per sq. ft. of grate per hour, according to its size.

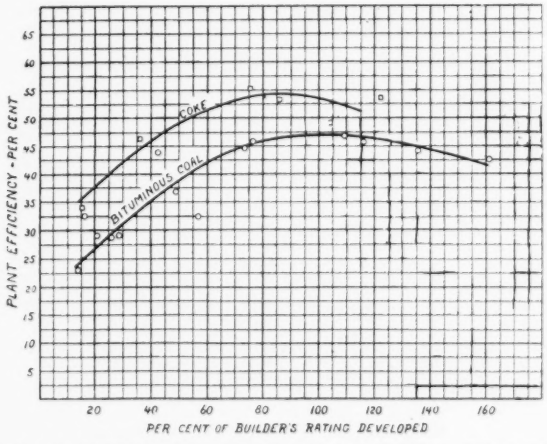


Fig. 1. Relation of Plant Efficiency to Capacity Developed, Boiler D_1.

A house containing 1,200 sq. ft. of radiating surface will require 1,200x250=300,000 B. t. u. per hour. Allowing 50 per cent efficiency for the boiler and 12,500 B. t. u. per lb. for the coal, will give us

$$\frac{300{,}000 \times 2}{12{,}500} = 48 \text{ lb. of coal required per hour.}$$

A boiler ordinarily selected for this sized job would probably have 6 sq. ft. of grate, and at above rate would burn 48 ÷ 6 = 8 lb. of coal per sq. ft. of grate per hour.

Allowing 250 lb. of coal at one charge, it would hold fire for 5 hours, quite different from the 10-hour intervals so much talked of. But we must remember that this is an extreme condition, and the eight-pound rate of combustion would probably seldom be used except in the morning and evening, or during extremely cold weather. For this reason it is not wise to install a large boiler or furnace in order that it may be able to carry the extreme cold-weather load for a period of 10 or 12 hours with one firing.

The question then arises, what is the average rate of combustion—or the average load carried for the entire heating season? How near would this come to the maximum rate of 8 lb., and what are the probable limits and the efficiencies obtained?

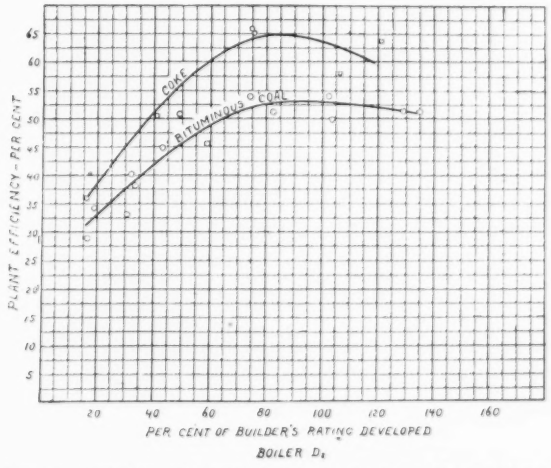


Fig. 2. Relation of Plant Efficiency to Capacity Developed, Boiler D_2.

The length and severity of the heating season will vary with the locality and weather conditions. Assume a heating season of six months and a coal consumption 18 tons, which will answer for a moderately cold climate. This will allow 200 lb. of coal per day, or 1.4 lb. per sq. ft. of grate per hour. Quite different from 8 lb. at full load, giving perhaps 17 per cent capacity as an average for the entire season. If we increase the coal allowance to 24 tons, the coal per sq. ft. of grate per hour would be increased to 1.8 lb., or about 22 per cent capacity. The first case (18 tons) is more likely to meet average conditions for this size of house.

The accompanying diagrams and table will serve to illustrate this case and make the requirements more easily understood. Figs. 1 and 2 are plotted from actual tests on two styles of small house-heating boilers. It will be noticed that while the efficiency for coke is greater, the range of good efficiency is much more limited than when burning bituminous coal. These curves show the

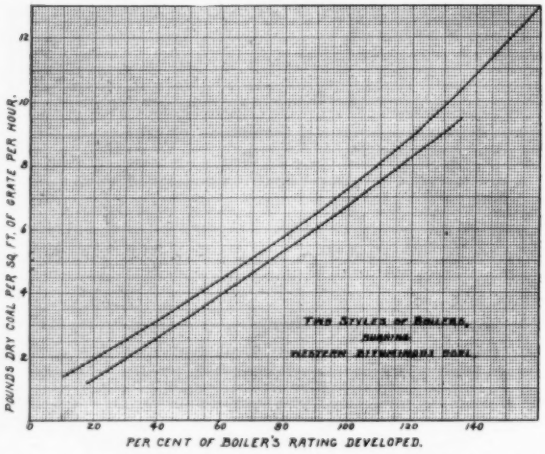

POUNDS DAY COAL PER SQ. FT. OF GRATE PER HOUR.
PER CENT OF BOILER'S RATING DEVELOPED.
TWO STYLES OF BOILERS, BURNING WESTERN BITUMINOUS COAL.

Fig. 3. Curves Representing Capacities Developed by Two Styles of House-Heating Boilers.

efficiency that may be obtained under good conditions, with boilers kept clean and given careful attention.

The curves in Fig. 3 are based on the results of these same tests, and show the relation between the capacity developed and the rate of combustion. It is quite probable that under ordinary conditions, more coal would be required than shown by these curves, but they show what can be done, and give an idea as to what may be expected.

ing three pounds of coal per sq. ft. of grate per hour should develop 40 per cent of the 1,200 sq. ft. rating, at an efficiency of about 40 per cent. It will be noticed that the most efficient range will be when developing

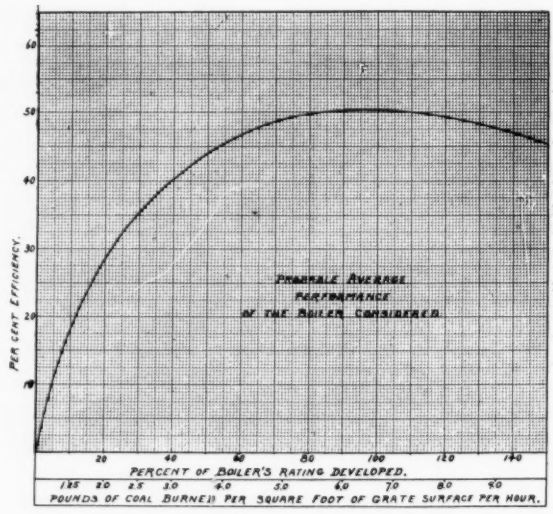

PER CENT EFFICIENCY.
PROBABLE AVERAGE PERFORMANCE OF THE BOILER CONSIDERED.
PERCENT OF BOILER'S RATING DEVELOPED.
POUNDS OF COAL BURNED PER SQUARE FOOT OF GRATE SURFACE PER HOUR.

Fig. 4. Relation Between Rate of Combustion, Capacity and Efficiency, for Boiler Considered.

from 70 to 130 per cent of the boiler's rating, and the curve is fairly flat between these limits. Below 40 per cent capacity the efficiency falls off very rapidly.

The accompanying table is computed for the two rates of combustion already mentioned, 18 and 24 tons of western bituminous coal per 6 months' season. For ease of comparison the season is divided into various periods, 5 days of very severe weather, 5 days not so cold, and so on. Column 2 merely gives the average rate of com-

TABLE 1—PROBABLE RATES OF COMBUSTION FOR A SIX-MONTH SEASON.

Length of Period Days	Lb. of Coal Fired per Sq. Ft. of Grate per Hour.			Lb. of Coal Fired During			Tons of Coal Fired During Period	Probable Average Value During 16 Hour Day Charge. Per Cent.	
	Average for 24 Hours	Night Charge 8 Hours	Day Charge 16 Hours	24 Hours	Night Charge	Day Charge		Capacity	Efficiency
BURNING 18 TONS OF COAL IN SIX MONTHS									
5	5.0	2.0	6.5	720	96	624	1.8	100	50
5	4.0	2.0	5.0	576	96	480	1.5	75	50
15	3.0	1.5	3.75	432	72	360	3.2	50	45
45	2.0	1.0	2.5	288	48	240	6.5	30	35
50	1.0	0.5	1.25	144	24	120	3.6	10	20
60	...	...	0.47	45	..	45	1.4	5	10
BURNING 24 TONS OF COAL IN SIX MONTHS									
5	5.4	2.0	7.0	770	96	674	1.9	105	50
5	4.7	2.0	6.0	672	96	576	1.7	90	50
15	3.2	1.5	4.0	440	72	368	3.3	55	45
45	2.3	1.0	3.0	336	48	288	7.5	40	40
50	1.7	1.0	2.0	240	48	192	6.0	20	30
60	...	...	1.25	119	..	119	3.6	10	20

The curve and figures in Fig. 4 are based on these results, and are about what might be expected under average conditions for the size of boiler under consideration. The lower row of figures gives the probable rate of combustion to develop the various capacities, and the figures on the left side of the chart show the efficiency that should be obtained at these various rates of combustion. According to the curve, this boiler when burnbustion for the 24 hours and is based on the assumed rates for the eight-hour night period and the 16-hour-day period. It will be noticed from column 3 that for 60 days no coal is allowed for keeping fire at night and during the other periods only enough to keep up a moderate fire. Column 4 gives the average for the 16 hours, and will very likely be more in the early morning and evening, and less during the middle of the day. The

next three columns give the total weight of coal burned during these respective intervals and the 8th column gives the tons of coal burned during the period stated in the first column.

The last two columns give the probable average capacity and efficiency that might be expected during the day charge, based on the test results already mentioned. It will be noticed that for two-thirds of the heating season, the efficiency is very low, and the boiler runs at only from 5 to 20 per cent of its rating. Also that the more the boiler is forced, the higher the capacity and resulting efficiency during the long, low-duty periods.

It will be seen from the curve in Fig. 4. that this boiler might have been run at 20 or 30 per cent overload without great sacrifice in efficiency, and the table shows that the higher we keep on the curve for the entire season, the more economical the results. The great drawback is that with the small fire-pot provided in most of these boilers, they have very little magazine-capacity, and to carry these higher rates of combustion requires frequent firing. To develop 20 per cent overload would require 48 lb. of coal per hour, and require firing every five or six hours. But this would only be required during perhaps 10 or 15 days in the season, and during perhaps three-fourths of the season the boiler would hold fire for from eight to twelve hours without any trouble.

A SYSTEM OF PERPETUAL INVENTORY, COST AND SELLING PRICES IN ONE OPERATION.*

This paper describes a system of "perpetual inventory, cost and selling prices in one operation" as used with great success by a jobber of plumbing and heating supplies. With some modifications it can no doubt be applied with equal success to the operation of the contracting end of the plumbing and heating trade, and we therefore take pleasure in publishing it herewith in full:

When our worthy secretary wrote me that, at the request of several jobbers, I be asked to explain the Perpetual Inventory, that we have kept for about eight years, to the members of the asso iation, I hesitated about accepting, because it made me feel somewhat like the young general, who, when about to engage in a desperate battle, called his staff around him and said: "Officers, we are about to engage the enemy of a far superior force. Those who fight to the finish will probably be killed. Let us all be brave and fight as long as we can and run to cover, if necessary, and as I am lame, I will commence running now."

However, upon learning that one of these requests came from our President, Mr. Beecher, whose house is establishing branches in all the large cities, I consented, believing it might benefit us all, if we could interest such a firm (and there are more) in a system that prevents getting surplus stocks, and I hope that after I have outlined this Perpetual Inventory and Price System it will not be considered "second hand goods," as the little daughter of a prominent New Yorker said, when out in the country on a farm and seeing the cows milked, that she would not drink any of the milk during her stay, because she did not want it after the cow had had it.

I know that several jobbers keep a Perpetual Inventory of the movement of their stock, and I have yet to find one who has given it a reasonable trial who has thought of giving it up. I know of one concern which in four months after putting in effect the Perpetual Inventory, reduced its stock $20,000, and had more goods to fill its actual requirements than ever, but did not have any more goods that were slow sellers.

Any system is not a good one unless it gives maximum efficiency at a minimum cost. Any system is not good if it is so intricate that it requires an expert to carry out the details. It should be simple, yet give the manager all the necessary information.

I know from experience that the buyer for a jobbing house of any size must, as a rule, consult the "Czar," the stockman, before he can order in any stock of any class of goods, to ascertain how much he has in stock, how it is moving, and the probabilities for the future. The answer as to the amount, if any, frequently depends whether or not "Mr. Stockman" was first seen by the manufacturer's salesman and the very best a stockman can do for a buyer is a guess of what is required. Would you leave any other vital part of your business to a guess, generally made by a $15 a-week man?

By a Perpetual Inventory System the buyer can have any moment from the records a statement made out by any clerk in the office, showing the stock on hand, the amount ordered, the sales since January 1, and the sales for every year previous that the system has been in effect. We also go farther and keep the list cost and selling price for a great many items on the same record, especially all goods that do not change in cost frequently. Our Perpetual Inventory is kept on card 4 in. x 12 in. with 4 articles on each card. Subject index cards are arranged alphabetically with large index, and each subject is followed by the different kinds arranged alphabetically.

Example:—Subject card "Malleable Fittings" is followed by Index Card— "Caps" of 12 sizes or 3 cards, next Index Card—"Couplings, etc. These cards are placed in steel boxes with loose covers, with about 300 cards in a box, and three boxes will easily hold all the necessary cards for any jobbing business of Plumbing and Steam and Water Supplies.

In a loose-leaf inventory-book you have to handle over uselessly a great many pages to find your items. In a card inventory you reach at once to the item wanted, and cards do not wear out like thin sheets of paper. Our cards last about 2 years. Our cost and price clerks turn to the card, check the sale on the card, take the list on the card, cost, discount and selling price all in one operation. There is less time consumed in finding their list alone on the cards than if they looked it up in a catalog, because they get very adept in locating immediately any item. Any good clerk will check off the goods sold, list price and put in costs on 100 to 130 average plumber's orders daily in this system. We find that it takes not over three hours extra for the labor in checking off the cards for this amount of orders. Any good clerk will, in four to five hours daily, put on the cards all orders placed, giving date and amount ordered, date and amount goods received, and make out necessary requisitions to keep the stock up to its requirements. Minimum quantities are shown on each card, and it is his duty, as soon as a stock reaches the minimum quantity, to make out a requisition covering all the goods in that class that are down or nearly down to the minimum quantity, giving sales last year, this year, and the amount in stock. The manager then orders according to the market, and can do so intelligently.

It is a fact that this system, or any other system, will not run itself. The work must be done daily and accurately. But we find that it does not consume as much time as is usual with the average stockman under the old way, and it gives a far greater efficiency.

*Address by S. E. Hunting, president of the Hunting Co., Watertown, N. Y., delivered before the Eastern Supply Association at the midsummer meeting, held at Chalfonte, Atlantic City, N. J., June 22, 1911.

THE PLUMBING-CODE QUESTION ANSWERED.

Editor "Domestic Engineering":—Referring to the plumbing-code question in the September 23rd issue, I wish to state that several city codes require the burr to be reamed out on wrought-iron pipes in plumbing systems; among them are New York, Minneapolis, St. Paul and Kansas City. I am not aware of any regulations of that sort pertaining to gas-pipes.

Chicago. J. C.

THE Y-FITTING PROBLEM.

Editor "Domestic Engineering":—Referring to H. N.'s question in the September 23rd issue, it seems to me to be too indefinite. Try an insert fitting below the 4-in. x 2-in. You can insert the whole thing in the space of one length of pipe.

Chicago. J. T.

Editor "Domestic Engineering":—I would answer H. N.'s question as follows: If the owner does not want very much expense, and if there is no plumbing ordinance in your town, we would suggest that you get a pipe-band with Y-outlet. By looking in any of the catalogs that show soil-pipe fittings, you will see what this is. The way these are generally put on is by first tapping a 2-in. hole in your pipe, then a piece of good grade of flat packing such as "Rainbow" should be put in between this band and the 4-in. pipe. Your bolts are then fastened and you have your Y in and all ready for business. This is not the best kind of a job, but it is the least expensive and generally answers the purpose.

Editor "Domestic Engineering":—In answer to H. N., of Buffalo: See that the stack is saddled or well supported on floor above. Then cut where Y branch will fit properly and cut about 2¾ ft. below and take out piece. Put back with a plain 4-in. sleeve.

See that ends of pipe are square and meet well, then paste a piece of paper over the two ends and soil well. Then place the joint-runner in place at bottom of sleeve so that center of sleeve comes where pipes meet; see that sleeve is centered on pipe, then putty around runner to keep lead from running out and pour with good hot lead.

Fredonia, N. Y. "Country Plumber."

HOW TO WIPE SERVICE-PIPE JOINTS.

Editor "Domestic Engineering":—Answering the question from Rochester, N. Y., concerning the best way of wiping service-pipe joints, will say, what I consider the best method for such joints: Prepare the joint in the usual way; properly clean the receiving and spigot-end of pipe; put in place, then burn connecting ends together. This can be done by having well tinned soldering iron. Get iron near red heat, then proceed to burn ends together with lead, same as if soldering. When well burned together, wipe joints any way you wish, either vertical or horizontal. When joint is wiped and before same is cold, pick up and turn around so as to prevent tin from running to any one part of joint. Joints made in this manner cannot break, sweat or leak, and can be made tight with poor solder.

Wichita, Kans. W. E. E.

Editor "Domestic Engineering":—The best way to wipe street connections is to wipe what is called an upright joint. You no doubt have had experience in wiping joints with pipe in a horizontal position, and have found the solder to drop. This is overcome when joints are wiped upright, for if there is any dropping you will find it to drop into the cup. Or in short, what this wiping joints uprights amounts to is that you make a wiped-joint on top of a cup-joint, and you will find this to hold a whole lot better than wiping "horizontal joint."

Minneapolis, Minn. M. H.

Editor "Domestic Engineering":—I fail to see why there should be any particular preference made by any one but the mechanic. He must always determine that from the circumstances under which he works. If he can wipe more easily in a horizontal than perpendicular position, that is the way to do it. Theoretically, the perpendicular position would be best.

Chicago. J. C.

LOCAL VENTING.

Editor "Domestic Engineering":—At what point should the local vent-pipe enter the flue, and why?

Rochester, N. Y. J. C. Goodwin.

The vent-pipe should enter the flue at a point above all other openings, otherwise it might be possible for some of the foul odors from the vent-pipe to be drawn back from the stack.

WHAT "BURNING OUT THE JET" MEANS.

Editor "Domestic Engineering":—Referring to the question submitted by N. R., St. Louis, Mo., I wish to state that "burning out the jet" in a closet-bowl means removing incrustations left by water or urine with nitric or muriatic acid. Dry out the bowl and trap; then apply the acid.

Chicago. J. T.

Editor "Domestic Engineering":—I would like to explain that by burning out is meant about the same as to clean out the jet, and the best way that this can be done, is by putting muriatic acid in the jet of the closet-bowl, and as muriatic acid burns, this process has been given the trade term of "burning out the jet."

WHY USE UNCHANGEABLE DIES?

Editor "Domestic Engineering":—It seems to me that our working friends in the craft who prefer adjustable dies before solid ones for threading pipe have been lured by occasional expedients into dark and dreary dearth.

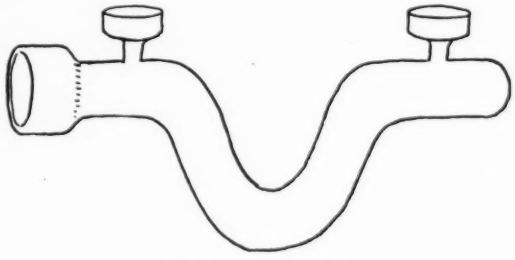
I assume all fittings are tapped standard sizes. They should be. All taps are fixed, unchangeable. Why changeable dies? I have seen that their use is mischievous, and

men who for a time thought them handy now use the solid die. Is not the use of adjustable dies illogical? Will mechanics continue to use them interminably?

Lenox, Mass. W. B. B.

A QUESTION ABOUT CLEANOUT AND FRESH-AIR-INLET.

Editor "Domestic Engineering":—With a house-trap of the type shown herewith, which opening should be used for cleanout and which one for vent? Or should they both be used for cleanouts, and an extra fitting for



The Trap in Question.

fresh-air inlet? If the latter is the case, on which side should it be placed? On the house or the sewer?

Bellefontaine, O. O. B.

The "bell" side of the trap should be placed toward the house, the spigot end to "run with the stream." Then the fresh-air inlet would be on the house-side of the trap and the other opening would be the cleanout.

It would perhaps be better in all cases to use an extra fitting for fresh-air inlet and use both openings for cleanouts.

SUBSTITUTES FOR PLASTER PARIS.

Editor "Domestic Engineering":—Referring to the question about a substitute for plaster paris, I would suggest that your subscriber use Keane's cement in place of plaster paris, and he will have no trouble. If plaster paris is mixed and applied properly, it will not drop off.

Chicago. T. C.

Editor "Domestic Engineering":—As a substitute for plaster paris I would suggest that you use copal varnish and dry white lead. You can get this at almost every paint store. This should be mixed to a sort of a putty, and while it costs a trifle more than plaster paris and also takes a little longer to dry, you will find that it is a whole lot more satisfactory and the best to use.

St. Louis, Mo. M. C.

THE ENAMEL DOES NOT GIVE RESULTS.

Editor "Domestic Engineering":—Recently, in finishing up a bath-room, I placed several coats of enamel upon a bath-tub and have not got it covered yet so but what the iron shows through. What can I do and what is the reason that the enamel does not give better results?

Chicago. C. J. R.

The enamel is intended for the finishing coat and not for the body. The tub should first be well rubbed down with somewhat worn sandpaper. When the surface is sufficiently smooth, a coat of lead-paint with plenty of body should be applied, and after this has dried, a second coat. Generally two coats of paint are sufficient, but if the original coloring of the tub still shows through, apply a third coat. After it has dried hard, the enamel can be applied and a finished job will appear, which should last for several seasons.

PRESSURE SHOWN BY THE NUMBER OF INCHES OF MERCURY.

Editor "Domestic Engineering":—When the mercury in the testing apparatus shows 20 in., to how many pounds pressure is it equal? Is there any need of running the mercury so high and insisting on its remaining so high for a gas test?

Pittsburgh. C. J. Haskings.

A showing of two inches of mercury in the glass is equal to one-pound pressure. Therefore if you had 20 in. of mercury you had 10-lb. pressure on the gas job. Many inspectors pass the jobs if they hold from 15 in. to 18 in. of mercury for half an hour, in other words, from 7½ to 9 lb., which is probably more than the job will ever be called upon to carry. We believe in giving the job a most thorough test and from 7 to 10-lb. pressure is not excessive. If the job will not stand up under that amount of pressure, it should be made to do so, according to our opinion.

INDIRECT RADIATOR FAILS TO GIVE RESULTS.

Editor "Domestic Engineering":—An indirect radiator that I placed in a building last winter failed to give satisfactory results. I am sure that it is large enough to do the business and it seemed to be always hot when there was any steam on. Can you suggest any remedy?

Milwaukee. G. C. Ely.

We should examine the hot and cold-air flues to see if they were air-tight. If so, look to the manner in which the indirect is boxed in. The chances are that the radiator-box is too large, so that the air does not get heated. The casing should fit close to the radiator to avoid admitting unheated air to the room.

THE SEWER-TRAP QUESTION AGAIN.

Editor "Domestic Engineering":—It is to be expected that there will always be a difference of opinion even on the question of sewer-gas and sewer-traps. It seemed to be a strange coincidence that the apparent conflicting articles on the question of sewer-gas, and the possible infection from same, should appear in the same issue of your popular journal.

H. J. Luff, of Cleveland, seems to take too seriously the possible escape of sewer-gas into the homes through a pin-hole in the casting of a partitioned trap. He no doubt permits a drum-trap to be installed, and feels perfectly safe as regards leakage through this form of trap. There are plenty of old masters who will stake a good bet that no drum-trap is safe from leakage unless the cover is below the water-line. I do not believe there is any question but what there are more loose-covered drum-traps than there are sand-holes or imperfections in partitioned traps. It is to be hoped that Mr. Luff will read the article on page 276 entitled "Sewer-gas and Disease," by Hollis Godfrey, in the same issue of "Domestic Engineering" in which his article appears.

The danger of infection from sewer-gas through the

system of plumbing as installed today is practically nil; no matter whether the plumbing has partitioned traps, drum-traps, anti-syphoned or plain traps. How is it that the manufacturer of traps in Cleveland, who is at least one of the parties to whom Mr. Luff refers, gets practically the monopoly on traps installed in the city of Rochester? Is it because they know more or less about traps down there than Mr. Luff does in Cleveland? I would like to repeat part of the article by Mr. Godfrey, as follows:

"In actual practice there are three possibilities of sewage or sewer-gases rising into a house through a trap. The level of water in the U of the pipe may fall so low as to leave the trap only partially sealed. The liquid, through some flaw, might disappear altogether. Gases generated on the sewer side might exert sufficient pressure on the liquid in the water-seal to force their way through to the soil-pipe. It is possible, moreover, though hardly probable, that germs might rise from the wetted interior surface of a soil-pipe. We have already seen that bacteria have a perceptible weight and tend to settle rather than to rise. Even with an open trap the only possibility of getting them into the house would be when they were borne on a strong air-current.

"No normal conditions would ever see an air-current of even 500 ft. a minute passing through a trap. The air in the soil-pipe was examined at different levels with the trap dried and wetted. Under no circumstances were any large number of bacteria found in the air. Only when the air-current was rushing through at its higher velocities were any bacteria dislodged at all. The conclusions of Professor Winslow follow:

"'On the whole, it appears that germs are carried into the air of a house-drainage system from its traps or wetted surfaces only by suction corresponding to an air current of 600 ft. per minute. It is scarcely conceivable that such a force could be exerted under any practical conditions.'

"The isolated fact that harmful bacteria are found in any place is not necessarily a sign of danger. They are so plentiful that we can scarcely escape them and their growth is so rapid as to be almost beyond our comprehension.

"Entering the Boston sewer in a boat-chamber, the investigators placed dishes containing sterile nutrients beside the eddying stream of sewage and on various steps leading to the street. The colon bacillus, characteristic of animal wastes, was found on every plate, but the numbers of these bacilli were least nearest the sewer, greatest nearest the street, and the increase from sewer to street was constant. Remember the point made earlier, that these organisms, tiny as they are, have a perceptible weight and settle swiftly, and you will see that these results indicate one thing—that the bacteria found in sewer-air come chiefly from street-dust infected by such agencies as manure, not from the sewer.

"The investigation of 19 plumbing systems in actual use showed the general air of house-drainage systems to be amazingly free from sewage organisms, far freer in fact than the air of the street or the common water-supply of many cities.

"According to this investigation, therefore, a man in an ordinary room would have to breathe undiluted sewer-air for 24 hours on a stretch if he were to take into the system as many sewage bacteria a pint of New York water contains.

"Suppose we sum the matter up with the closing sentence of Professor Winslow's report: 'I believe, however, that my results, in the light of all previous evidence, warrant the conclusion that the chance of direct bacterial infection through the air of drains and sewers is so slight as to be practically negligible.'

"The results obtained by Horrocks failed in two respects. His use of heavily infected, foaming emulsions to represent sewage did not actually represent the conditions which exist in a common house drain-pipe or in the sewer."

Trusting that you will be able to permit sufficient space for this article, I am, Very truly yours,

North Tonawanda, N. Y. Master Plumber.

WHEN WRITING, GIVE FULL ADDRESS.

Now and then some one writes a letter asking a question requiring an immediate answer. The job is being undertaken, the problem has been encountered, and it needs solution. We endeavor to answer all inquiries within 24 hours after their receipt. Sometimes, however, three or four weeks later the answer drifts back, the address being insufficient. In this connection we would like to notify through our journal J. L. Sisson, who gave his address as Enon Valley, Pa., that our letter to him of September 1st has been returned. We want to hear from you all, but when you write, make sure that the address is correct, as our mind-reading department is on a vacation.

THE FLESHPOTS.

It was pleasant to flee from the fret and the heat
To the cool of the countryside's fragrant retreat.
It was joyful, indeed, to lay worry aside,
To loaf and grow fat, and let everything slide,
To shun all the sparkle and glitter and sham
For the twitter of birds and the bleat of the lamb.
Yet, now we are back to the "revel and waste,"
The fleshpots of Egypt are good to the taste!

To flirt with Dame Nature by mountain and shore
Is jolly enough for a fortnight or more,
And who wouldn't cheerfully hit for the camp
Where you eat like a wolf, and you look like a tramp?
You gain a new zest for the "world's bitter fight,"
You get a new tan and a new appetite,
And when to the city your steps are retraced,
The fleshpots of Egypt are good to the taste!

We leave 'em behind us, we swear we are sick;
Their savor's too rich, and the sauce is too thick;
The clangor, and hurry, and bustle, and din,
We hate them—we say—as we ought to hate sin.
And thus we depart for the Summer, but soon
The city pipes up its enticing old tune,
And we dance as of old, and we come in our haste,
For the fleshpots of Egypt are good to the taste.

—Berton Braley in Ainslee's.

Unwelcome Advice.

"Kind friend," whined the beggar, "I'm trying to get to Glasgow, and I've got the price of a ticket all but sixpence. Will you help me out?"

"No, but I can give you some excellent advice," replied the gentleman he addressed. "Take the train to within a sixpenny fare of Glasgow and then walk."—Tit-Bits.

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"And your husband gave $50,000 for that old book?"

"Yes," replied Mrs. Cumrox.

"To show how much you care for literature, I suppose?"

"No. To show how little we care for $50,000."—Washington Star.

Different Hot Water Heating Systems and Method of Connecting Them to a District Heating System*

By A. C. Rogers, Toledo, Ohio

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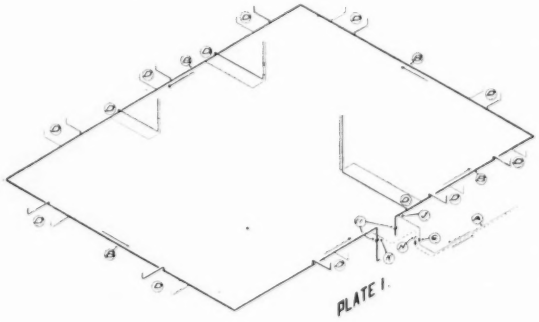

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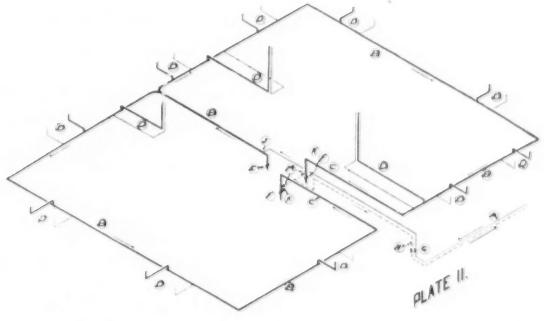

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A general supervision of house installations when connected to district heating is incumbent upon the engineering department of the heating company. This holds good for hot-water as well as steam-heating and is largely practiced by all companies. As regards new work this presents a problem that may be easily accomplished, but when contemplating heating systems already installed

system of plumbing as installed today is practically nil; no matter whether the plumbing has partitioned traps, drum-traps, anti-syphoned or plain traps. How is it that the manufacturer of traps in Cleveland, who is at least one of the parties to whom Mr. Luff refers, gets practically the monopoly on traps installed in the city of Rochester? Is it because they know more or less about traps down there than Mr. Luff does in Cleveland? I would like to repeat part of the article by Mr. Godfrey, as follows:

"In actual practice there are three possibilities of sewage or sewer-gases rising into a house through a trap. The level of water in the U of the pipe may fall so low as to leave the trap only partially sealed. The liquid, through some flaw, might disappear altogether. Gases generated on the sewer side might exert sufficient pressure on the liquid in the water-seal to force their way through to the soil-pipe. It is possible, moreover, though hardly probable, that germs might rise from the wetted interior surface of a soil-pipe. We have already seen that bacteria have a perceptible weight and tend to settle rather than to rise. Even with an open trap the only possibility of getting them into the house would be when they were borne on a strong air-current.

"No normal conditions would ever see an air-current of even 500 ft. a minute passing through a trap. The air in the soil-pipe was examined at different levels with the trap dried and wetted. Under no circumstances were any large number of bacteria found in the air. Only when the air-current was rushing through at its higher velocities were any bacteria dislodged at all. The conclusions of Professor Winslow follow:

"'On the whole, it appears that germs are carried into the air of a house-drainage system from its traps or wetted surfaces only by suction corresponding to an air current of 600 ft. per minute. It is scarcely conceivable that such a force could be exerted under any practical conditions.'

"The isolated fact that harmful bacteria are found in any place is not necessarily a sign of danger. They are so plentiful that we can scarcely escape them and their growth is so rapid as to be almost beyond our comprehension.

"Entering the Boston sewer in a boat-chamber, the investigators placed dishes containing sterile nutrients beside the eddying stream of sewage and on various steps leading to the street. The colon bacillus, characteristic of animal wastes, was found on every plate, but the numbers of these bacilli were least nearest the sewer, greatest nearest the street, and the increase from sewer to street was constant. Remember the point made earlier, that these organisms, tiny as they are, have a perceptible weight and settle swiftly, and you will see that these results indicate one thing—that the bacteria found in sewer-air come chiefly from street-dust infected by such agencies as manure, not from the sewer.

"The investigation of 19 plumbing systems in actual use showed the general air of house-drainage systems to be amazingly free from sewage organisms, far freer in fact than the air of the street or the common water-supply of many cities.

"According to this investigation, therefore, a man in an ordinary room would have to breathe undiluted sewer-air for 24 hours on a stretch if he were to take into the system as many sewage bacteria a pint of New York water contains.

"Suppose we sum the matter up with the closing sentence of Professor Winslow's report: 'I believe, however, that my results, in the light of all previous evidence, warrant the conclusion that the chance of direct bacterial infection through the air of drains and sewers is so slight as to be practically negligible.'

"The results obtained by Horrocks failed in two respects. His use of heavily infected, foaming emulsions to represent sewage did not actually represent the conditions which exist in a common house drain-pipe or in the sewer."

Trusting that you will be able to permit sufficient space for this article, I am, Very truly yours,

North Tonawanda, N. Y. Master Plumber.

WHEN WRITING, GIVE FULL ADDRESS.

Now and then some one writes a letter asking a question requiring an immediate answer. The job is being undertaken, the problem has been encountered, and it needs solution. We endeavor to answer all inquiries within 24 hours after their receipt. Sometimes, however, three or four weeks later the answer drifts back, the address being insufficient. In this connection we would like to notify through our journal J. L. Sisson, who gave his address as Enon Valley, Pa., that our letter to him of September 1st has been returned. We want to hear from you all, but when you write, make sure that the address is correct, as our mind-reading department is on a vacation.

THE FLESHPOTS.

It was pleasant to flee from the fret and the heat
To the cool of the countryside's fragrant retreat.
It was joyful, indeed, to lay worry aside,
To loaf and grow fat, and let everything slide,
To shun all the sparkle and glitter and sham
For the twitter of birds and the bleat of the lamb.
Yet, now we are back to the "revel and waste,"
The fleshpots of Egypt are good to the taste!

To flirt with Dame Nature by mountain and shore
Is jolly enough for a fortnight or more,
And who wouldn't cheerfully hit for the camp
Where you eat like a wolf, and you look like a tramp?
You gain a new zest for the "world's bitter fight,"
You get a new tan and a new appetite,
And when to the city your steps are retraced,
The fleshpots of Egypt are good to the taste!

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The clangor, and hurry, and bustle, and din,
We hate them—we say—as we ought to hate sin.
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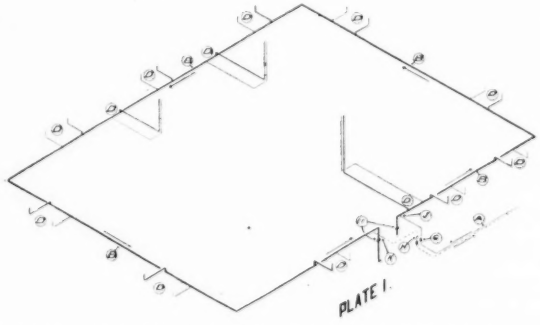

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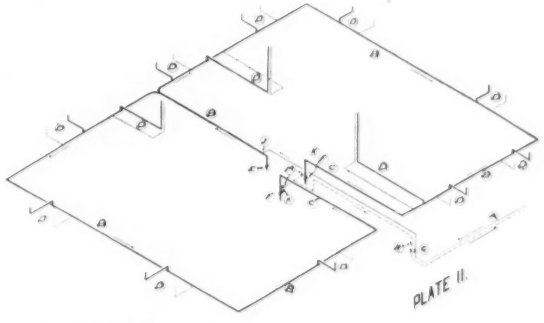

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and being locally heated, the engineer may expect to meet difficulties both in the system and with the owner. An owner may be indifferent to results and economy when running his own heating-plant and yet may be very exacting when getting service from a district-heating company. The engineer often meets with systems that cause him to wonder how heating was ever thought of or accomplished.

In considering this subject, a valuable asset to the writer is the experience of connection with a district-heating company and the results by the department with which he is detailed.

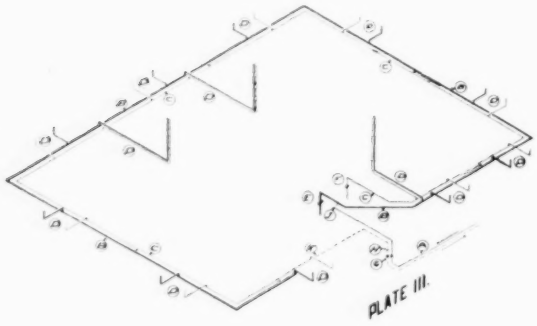


PLATE III.

In Plate I we illustrate a system that was used more some years ago than now, although when properly laid out and installed gives very good results. The feed of all radiators is taken off the top of the main and the return is put into the side of the main. In this system there is gradual drop in temperature as the water flows along the main, due to the cooled water in the radiators dumping back into the main, and the radiators must be figured for this drop to give the results desired. The method of adjusting for district-heating in this case is as follows: The boiler is cut out by putting valves in the flow and return pipes or blank flanges or blind gaskets in flange unions as at "E" "F", the expansion-tank is cut off by valve or by capping or plugging the leads to it; the service is cut in by tapping the main at "J" and "K." Service-valves "G" are always put on service inside building wall and regulating-valve "H" is placed on the service return-pipe just before leaving the building; by proper adjustment of "H" the results are fully up to all that was ever accomplished by local heating if not better.

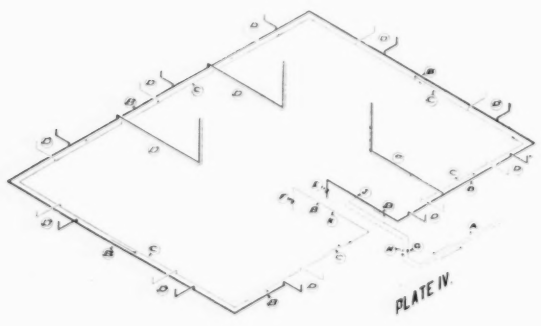


PLATE IV.

In Plate II a system the same as Plate I is illustrated, except that the system has two belts and in addition to the instructions for Plate I the return has two connections, and regulating cocks "M" are installed on both returns and adjusted to equalize both belts, preventing a short circuit in either belt and giving an equal distribution.

Plate III. This is an illustration of the well known two-pipe underfeed gravity, and the following method is given. Blank off boiler at feed and return and also expansion-tank; tap feed-service in at boiler as at "J" and tap return in extreme end of return-main away from boiler as at "G"; this method prevents short-circuiting and promotes a balancing that is otherwise troublesome.

Plate IV. This is an illustration of a single-belt two-pipe underfeed gravity with parallel mains but opposing flow. The writer would place this system at the head of all underfeed work. The mains of themselves will practically make a balance to the job, and a building, even though quite large, with clearance for mains, can be accommodated on one belt. This job will work gravity without pitch to mains providing the size of mains is liberal. The method of connecting to district-heating is readily outlined.

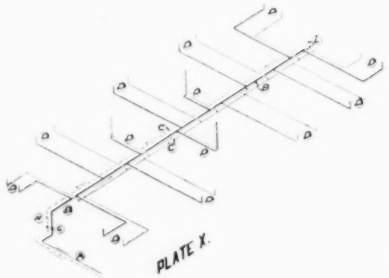


PLATE X.

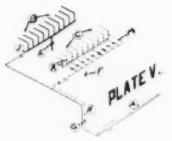


PLATE V.

Plate V. This is a sketch of only a portion of a multiple underfeed system, only the headers being shown. We meet this work sometimes and make the following for connecting: Tap main-flow header at "J" and tap each return marked "C" at "K", installing a cock "M" for regulation on each unit; the boiler is blanked off as before at "E" "F"; by adjusting "M" with opening in each to suit the duty a balance is made and short-circuiting prevented.

Plate VI. This is a one-pipe forced-feed series system and for district work only, where at one time it was universal for district work. The sketch shows the pipe-main carried along between the radiator-branches, which is called a by-pass, and the sketch shows three different kinds; first a small pipe by-pass "N"; the pipe being smaller than the main favors a flow through the radiator; next a by-pass with cock for adjustment or a union with a disc with a hole of proper size, this being shown at "O"; and next a full by-pass as at "P" with branches taken off with "Y" fittings or branch tees. There are some places such as shown in Plate XI where this system is

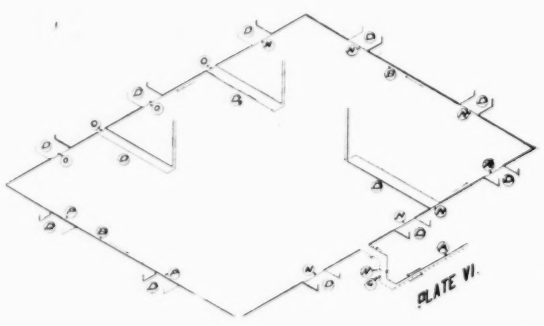
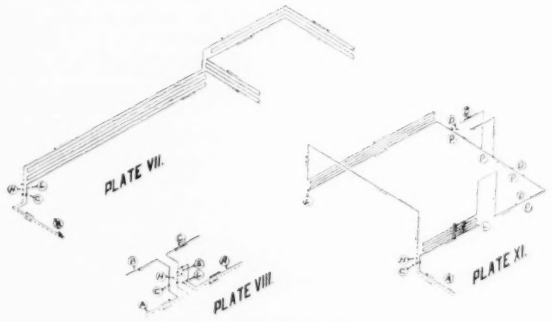


PLATE VI.

the only way, but for house or residence work this system is not allowed any more.

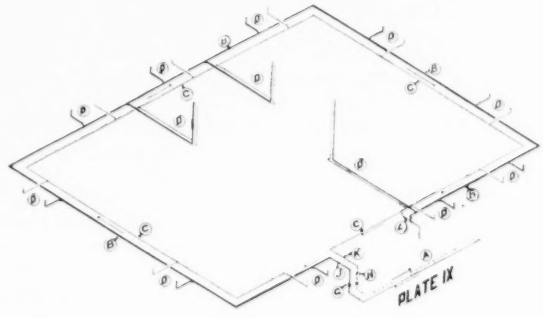
Plate VII shows a forced-feed heating-coil, such as for factory and garage work. The feed is connected to the bottom of coil and return is out the top; by this method a full pipe is assured and the coil is self-freeing of air, all air being driven out and no air-vents being needed. The sketch shows a coil running along the wall with right-angled branch and a continuation through to another room; headers cannot be used in this work on account of short-circuits and a return-bend coil is used;



where a header-coil is met with, discs or cocks for regulation in each coil-pipe are necessary.

Plate VIII shows a method in use where a garage is supplied after heating the residence; the garage-service is shown and marked "R," the same being cut in the return-pipe only, and for control a by-pass "S" with three valves is installed. By this method the garage is fed when wanted and otherwise cut out; when garage is on, regulator "H" is opened for larger feed and good results are found to be the case.

Plate IX shows the standard two-pipe pressure gravity system which is locally called "double belt" and is the system most generally used now. It gives perfect results, is low in friction and balances up with no drawbacks; it is very sensitive though and any trap in radiator-branches is fatal to that radiator; this belt on say 20 ft.



by 30 ft. can supply 1,200 ft. of radiation with ample results; larger belts are made in 2-inch and 2½-inch pipe-sizes.

Plate X shows the same system for locations where the radiators are located in a narrow zone; it is a three-pipe belt and gives results that are all that is expected; for double flat-buildings this is specific.

Plate XI shows a system installed in a garage which is a series pipe job with both radiators and coils; a radiator located on floor above is shown; the front of garage having large doors and also a side-door with cement floor causes the belt to be carried over the openings; traps are thus formed, and while not detrimental to heating with this job, yet for safety when shut off drips are placed on all low points.

In conclusion I want to mention again the sensitiveness of all hot-water pressure heating work; the best results are demanded of all district-heating companies, and again reliability, simplicity and above all economy are expected of the engineering department of the company.

Two other systems will be mentioned only, as this paper has probably exceeded its bounds. Both are what is termed overfeed, that is, the feed is carried to the top of building and fed downward, the return being in basement; the runs of the mains are similar but the branches for radiators are different. In the first a single pipe making a vertical series is used in which all radiators on that branch are in series and radiation must be the feed for it; in the other the radiator branches are fed in multiple and the feed supplies all radiators, while a separate return-pipe carries the cooled water from the radiators. Both can be used on pressure work but the writer would strongly urge the last system for both gravity and pressure work. These overhead systems are recommended for buildings of more than three stories high and where attic room can accommodate the main.

FALL MEETING OF THE TRI-STATE MASTER PLUMBERS' ASSOCIATION.

Meetings of the Tri-State Plumbers' Association, which consists of master plumbers from Ohio, Pennsylvania and West Virginia, will soon be resumed after a lay-off during the heated period of the summer. The first meeting will be held at the Thompson House, East Liverpool, after which meetings will be held at Steubenville and Wheeling.

HORNELL, N. Y., MASTER PLUMBERS ORGANIZE.

Pres. John H. Moran, of the New York State Association of Master Plumbers, has announced the organization of a new local to be known as the Master Plumbers' Association of Hornell, N. Y. The following are the first officers of the new organization: President, M. G. Lippincott; vice-president, F. S. Rust; secretary, J. Edward Shaut; treasurer, Wm. F. Schultz. The new local starts off bravely with seven members, including, in addition to the above-named officers, R. J. Miller, Edward H. Marley, and Frank B. Peck Co.

Waukon, Ia.—D. J. O'Leary has opened a plumbing and heating establishment on Main street.

Spencer, N. C.—G. L. Steele has purchased the plumbing department of the Spencer Hardware & Plumbing Co., and he will hereafter conduct it in his own name.

Sharon, Pa.—The Union Plumbing Co., has been dissolved. William G. James has bought out the interest of his two partners, H. L. Dunham and William Fette.

Grafton, W. Va.—Job Jones and C. W. Perine, have opened a large plumbing and heating establishment. Pipe fixtures will be featured by the new concern.

Tulsa, Okla.—W. H. Hickerson, a member of the Flannigan & Hickerson Plumbing Co., received fatal injuries in a recent fall at Coalgate, where he had been doing some work. Missing his footing, he fell from the top of a stairway and fractured his skull.

Los Angeles, Cal.—Bids for heating and ventilating the museum, science and art buildings in Exposition Park were opened by the board of supervisors this week. The bids ranged from $4,900 to $7,000 and were taken under advisement.

Akron, O.—The city council is considering an ordinance introduced in that body recently providing that the question of purchasing the plant of the Akron Water Works Co. at a figure not to exceed $815,000 be submitted to the vote of the people.

THE JOURNEYMAN AND HIS HELPER

JOIN HANDS FOR BETTER WORK

BOKOO HEAT FROM B. T. U.

Editor "Domestic Engineering":—At the close of my last letter I promised to give voice to a few more of my feelings on the question of the "merchant master plumber" introduced and fathered by my esteemed fellow-townsman, "The Squire," and I trust you will pardon my tardiness in coming across.

I had about concluded, with all these pennant races to keep track of, and the fresh batches of foot-ball dope to assimilate, and with the weather-indicator pointing to early frosts for our neighborhood, that I would be comfortably busy for a pay-day or so yet and would forego, for a spell anyway, the pleasure of scratching some more in "The Squire's" back yard.

But alas! I perceive "Ye Squire" resteth ill at ease. His hankering is for the fray. And, while one gathers from a few of his phrases that his mind also dwells to some extent on the score-boards, it is obvious that reflections on far deeper subjects are his hobby.

Just take a peep at the last issue of this department and see if I am not telling you the truth. And, while you are peeping, just light up your pipe and go through the whole letter and you will see what "The Squire" would do to this little business of his and ours.

Now before I get too far into this thing myself, I would like to make it clear just what I contend, which is this:

I believe the business is O. K. as it is conducted today, and with a little touching up here and there can be made to go.

I believe to inaugurate a purely buying and selling system would ruin the business for both journeymen and masters.

I also believe the master who has been or who is a good thorough mechanic himself makes by far the best and most successful master.

Diametrically different views than those of "The Squire" on the same subjects, you see. Do you blame me for coming forth with a chip on my shoulder? "The Squire" claims that arguments are what he likes. So here goes.

Many and radical changes appear to be needed in the plumbing and heating business according to "The Squire." In his former letter, he thought he could fix things so he could keep house without the journeyman, and now he is equally certain there is absolutely no need for the journeyman master. (I wonder who'll come next!) But why? Why wouldn't a good honest journeyman plumber or fitter with a fair education and perhaps a wee bit of "mercantile instinct" to start with be a desirable master plumber?

"He is not a financial success," says "The Squire." Is this the only reason? Whose money does he lose if he makes a failure? And why does he "invariably" fail? (Which he doesn't.) Is it merely because he is a mechanic himself? I don't believe it is. The same causes that effect other failures effect his, and they are too numerous to mention here. He might be a little more susceptible to these causes than the business-wise master; that's all—so why shouldn't he start a shop? He has handled the tools for years, perhaps, to this very end. He has mastered the mechanical part; has kept awake and abreast of the times, been observant, spent his evenings and Sundays reading the experiences and gathering to himself the knowledge of others; he has become well and favorably known to a great many people; has been prudent and saving, and has a few dollars laid by. Why shouldn't he start a shop? And why hasn't he an equal show with the man acquainted only with "Messrs. Interest, Discount, Collection and Scientific Management"?

I'll admit that if many masters were more familiar with this row of "Messrs." they would be much better off and **a whole lot of them could get better acquainted with Mr. Practical Experience with profit as well!**

A master to be successful needs all the knowledge he can get and those with the trade down pat surely have the best start. I don't say the ignorant, illiterate, unschooled journeyman master could hoe corn with his business-wise brother exactly; but suppose he were a combination of the two, don't you think his chances would be better than if he were only business-wise? It looks so to me.

"The Squire" talks as though there is no such thing as a journeyman getting beyond his station of screwing on fittings and squirting oil, and he wouldn't want him to if he could. Let me tell you this: There are lots of shops being run by "Interest-Discount-Collection" men where the grimy, oil-scented journeymen are furnishing most of the real brains. I've known them many a time to send the hurry-up call for "Jim He Knows" to look over a piece of work that the business-wise boss didn't know any more about than the man in the moon knows about the price of cheese in New York!

"Men who understand the art of surrounding themselves with competent assistants" are needed, according to "The Squire." I think there are a great many of this kind of men among the masters right now. All "Interest-Discount-Collection" bosses are inclined to be very careful in this respect I have noticed. (They are strong for competent assistants.) Most masters are either looking for some one who is business-wise or some one who has had the practical experience; there are not enough masters who possess both kinds of knowledge themselves.

I believe "The Squire" is one possessed of but the business wiseness, else how could he ever advocate a purely buying and selling plan? He wants to buy and sell only. He would seek out the best market to buy in and make a quick turnover of the goods for a "fixed and known profit" and let it go at that; the same as the grocery, dry goods and hardware men are doing. On the other hand, a mechanic-master with no mind or inclination for business, who knows only his tools, would say to Mr. Jones: "You get the stuff and I'll put it in by the day." He sees only the wages and is satisfied with them.

Now take the **practical** "Interest-Discount-Collection" master, how does he proceed? He also buys close, the same as "The Squire." He also discounts his bills; he also collects them when they are due; he also does business "on

the front-door basis"; but does he turn over a bunch of material to Mr. Jones and say: "Here, Mr. Jones, is your material. You can get such and such a plumber to put it in"? Not much! Neither does he say: "I'll install these fixtures by the day, Mr. Jones." No! No! Not the **practical** "Interest-Discount-Collection" master. I should say not! He has used his mercantile brain in gathering these goods together at a good price and has the money put away to avail himself of the last discount. He has already made a profit that would satisfy "The Squire," but does he stop there? No sir! He still has a little knowledge that hasn't been used in the deal, and he at once puts this knowledge—which is practical ability—to work and proceed to make a little something out of that. He is a good mechanic himself and so has a good journeyman or two on hand to whom he is paying the scale of wages, or a little more, and on whom he can depend to do a job right, so he takes Mr. Jones' job complete, and as he happens to be a good estimator along with his other qualifications **he makes more on the installation than he does on the goods**

"But is the average master always a good estimator?" "The Squire" will ask. Perhaps not. **But the Practical "Interest-Discount-Collection" master always is.** All masters whatsoever pretend to be good estimators. Every mother's son of them will cry from the house-tops that they can't be beat on estimating. "The Squire" himself points with pride to his own "batting average" as an estimator, and with his business-wiseness already conceded, I can't for the life of me see where his kick is coming from. Can you?

I gathered from the first letter of "The Squire" that there was a great uncertainty in the business; a gamble that always spoiled the soup. He couldn't possibly have been referring to his own business. There is no question about "The Squire's" business-wiseness and he describes very clearly the duties of an estimator. "He must reckon on the other mechanics on the job, the condition of the weather, the quality of the goods to be installed, and other things without number." He knows what an estimator is up against all right, and his own "batting average" as an estimator "is not very far from the top." So why should he, or you, or any other master in the same position as "The Squire," forego an almost certain profit on installation?

There is no more uncertainty; no more of a gamble in this business than there is in any other. What uncertainty there is increases or diminishes as your knowledge of the business gets greater or less great. The uncertainty is what you make it yourselves. The plumbing and heating business is a competitive one. It requires brains to run it successfully, and energy to push it the same as any other business; that's all.

In conclusion, I must agree with "The Squire" that there ought to be something come in from the rest of the bunch. You fellows should all wake up and get into this. There must be more views on this question among you. I am of the opinion that what the business needs is improvement only, and not such radical changes as "The Squire" would like to see. I do not wish to see the business "insurged." I believe it can be made to pay, and pay well, without tearing it down and building it all over again. It needs brains of all kinds; it needs business heads; mechanical heads; economical heads; heads of all kinds, in fact, or else one head equal to all these.

What do you journeymen think? What do you masters think? Do you concur with the views of "The Squire"? Speak up! Come to the center of the board! Or the first thing you know "The Squire" will Bob La-Follettise the whole blooming cheese! (Which might possibly be contrary to your politics.)

Minneapolis. B. T. U.

A LABOR-DAY VERSE.

By Berton Braley in Minneapolis Times.

I talked of "common workmen" and of all our "unskilled labor,"
And I patronized the skilled ones in a condescending way,
I looked upon the mason—who, it happened, was my neighbor—
As a common person who was working by the day!
Yet I spoke with awe of people of "remarkable attainment"
(Who had won a legal battle or a literary prize),
But I never really savvied what the workman's kind of brain meant
Till I tried to toil a little—and I suddenly was wise.

For I planned to build a hencoop and a sort of heater to it
With some simple pipe connections and a very simple drain,
Yet I puttered and I spluttered when I started in to do it
And I botched the business plenty spite of all my stress and strain;

The Henkoop Heating Job.

Then I hired a "common workman" of the sort that I had slighted,
And he looked my henhouse over and he smole a gentle smile,
And with quick and certain labor all my awful breaks were righted,
And the job was swiftly finished in a smart and proper style.

So I learned my little lesson, which is very plain for seeing
That to size a fellow justly you must take him at his trade,
And the man you've often sneered at as "almost a human being"
May do many sorts of thinking which you never have essayed;
Digging ditches has its brain work—there's a knack in swinging shovel;
There's a lot of cerebration in an ordinary job,
So the ordinary workman, though he's living in a hovel,
May be just as keen as you are—and you needn't be a snob!

We Maka da War.

——— Viva Italia! Sail-a da ship,
Load-a da gun, go for da Trip',
Italian man, he hotta stuff—
Spoil for da fight, maka no bluff,
Viva— But say, boss, where ees dees war?
Who been declare her? What is she for?

—New York World.

THE MOST HARMFUL ELEMENT OF BAD AIR—NOT CARBONIC ACID GAS, AS FORMERLY BELIEVED—BUT ORGANIC IMPURITIES.*

Many persons used to entertain an idea which is rapidly becoming obsolete, that is, that the carbon dioxide in the air is the particular thing that creates the harm. Carbon dioxide is harmful only in that it reduces the oxygen supply by displacing it. As long as you can get a proper percentage of oxygen in the air that you breathe, the amount of pure carbon dioxide can be present—according to the best scientists of the last ten years—to an amount twenty times that which many engineers put as a figure destructive to life. **Carbon dioxide is not poisonous,** but when present in quantities in any air, it is a danger sign that impurities exist in that air. But, remember, that it is a sign-board and not the danger itself. It is the organic impurities exhaled at the same time as the carbon dioxide that are poisonous, so merely getting rid of carbon dioxide is a good deal like **burning up the danger sign to get rid of the danger.**

Authorities:

Ira Remsen, President of the Johns Hopkins University of Baltimore, one of the leading chemists of the world, has done much to expose this carbon dioxide bogie. He states: "Carbon dioxide is given off from the lungs just as it is from the fire. It is a waste product—it is not poisonous any more than water is. If, however, pure carbon dioxide is introduced into air it has been found that as much as 5% may be present without serious results to those who breathe it. (5% is 500 parts in 10,000, though 20 parts in 10,000 is claimed by some as destructive to life.) The ill effects of breathing the air of a badly ventilated room occupied by a number of human beings appear to be due for the most part to the presence of the small quantities of decomposing organic matter.

"Air and Health," by Ronald MacFie, the most exhaustive book that has yet been written on this subject, gives some very interesting facts. The author states that the largest amount of carbon dioxide found at present in particularly vitiated air conditions examined by Haldane and Osborne was between 50 and 57 parts in a volume of 10,000. Ventilating engineers used to assure us that 15 parts in 10,000 is a menace. MacFie states that 20 times this amount, or 300 parts in 10,000, can be safely breathed. But he and all other modern chemists put their thumb on the real trouble, viz: Carbon dioxide is non-poisonous, and outside of its displacement of oxygen is only a menace in that it indicates the amount of respiratory impurities in the air, and it is these impurities which ozone destroys by oxidation. Ozone does not destroy the carbon dioxide itself, but it does reduce organic impurities to their end products. As a matter of fact, carbon dioxide is colorless and odorless.

In "Air and Life," by Henry de Varigny, M. D., Sc. D., Member of the Societe de Biologie and Demonstrator of Museum of Natural History of Paris: "The atmosphere of a room may be considered vitiated as soon as it begins to smell close. This is not due to carbonic acid, which is scentless, but to organic impurities from the skin, mouth and lungs. The organic matter given off by each adult is generally between 30 and 40 grains, so that the peculiar close, unpleasant smell of inhabited rooms is largely due to emanation of refuse matter from the body."

In "Ventilation of Buildings," by W. G. Snow, S. B., and T. Nolan, A. M. M. S., quoting from "Expired Air and Problems of Ventilation," by Drs. Billings, S. Weir Mitchell and Bergey: "The discomfort produced by crowded, ill-ventilated rooms in not due to the excess of CO_2, nor to bacteria, nor in most cases to dusts of any kind. The two great causes of such discomfort, though not the only ones, are excessive temperature and unpleasant odors. The cause of the unpleasant, musty odor is unknown. It may be due in part to volatile products of decomposition contained in the expired air of persons having decayed teeth, foul mouths, or certain disorders of the digestive apparatus, and in part to volatile fatty acids given off with or produced from the excretions of the skin.

In "A System of Physiological Therapeutics," by S. B. Cohen, A. M. D., Yorkshire College, Leeds, Eng., Page 301, speaking of bad air: "Oxygen that has been breathed and re-breathed for sometime, while still able to support combustion, is unable to support life. Devitalized oxygen, however, may be made vitalizing again by the effect of an electrical discharge. (See Ozone)."

Again, in "Air and Health:" "Air containing merely carbon dioxide and moisture usually contained in vitiated air would not produce the effect of vitiated air, and vitiated air therefore must contain an additional constituent. This additional constituent, though undetected by chemists, is probably detected by the nose, for it is well known that air is oppressive and harmful not so much in proportion to the amount of carbon dioxide and moisture it contains as in proportion to its smelliness."

From Report of National Conservation Commission, U. S. Senate Document No. 676, by Prof. Irving Fisher of Yale University, page 707: "It has been supposed until recently that the presence of carbon dioxide gas in vitiated air was the chief evil caused by such air. Impure air will affect the lungs harmfully, but not till the amount of carbon dioxide contained is very large. Guinea pigs, on which the effect of bad air was observed, were not seriously affected by the carbon dioxide till it amounted to 14 per cent of the volume of the air."

From a paper read by Dr. Oscar Linder, M. A., Ph. D., at Convention of American Institute of Chemical Engineers, June 24, 1910:

"It is well known that this matter which we have defined as air sewage is a specially attractive ground for bacteria, miasmata and other animal and plant life of the lowest order, which thrive in cities and congested districts. In such small concentrations as ozone is employed in ventilation, the destruction of this air sewage is probably its beneficial action rather than the direct destruction of bacteria, which has sometimes been accredited to it. It has been proven that ozone, when diluted to the extent of one part in one part in one million parts of air, cannot act directly as a bactericide, but it is an established fact that even in such dilutions it acts as a deodorizer and destroyer of the food and favorite surroundings of the bacteria, thus depriving them of the conditions favorable to their propagation."

*Compiled from some of the world's authorities to assist architects, physicians, ventilating engineers, school boards and health boards in their pure-air problems, by the Standard Electro-Utilities Co., Chicago.

Leon, Ia.—Wm. Crichton & Son have been awarded the contract for a complete steam-heating plant in the Methodist church at Mt. Ayr, Ia.

St. Louis, Mo.—The Modern Heating Co., 2217 Lucas Ave., has been awarded the contract for installing heating system in the addition now being made on the police headquarters. The contract-price is $4,419.

"Domestic Engineering" Cartoon on "The Big-Contract Egg"—No. LII.

The Setting That Hatched a Monster

If you want to possess a special proof of this or any other of our cartoons, let us have your request at once. We have many applications for our cartoons for framing and want to take good care of all demands made.

Interesting Types of Graduated Radiator-Valves

Fuel costs money. Fifty years we did not think so. Then, the householder counted as his chief investment a wood stove, a large fire-place or a huge cannon-ball stove and figured his fuel-cost as practically negligible. Now, however, the faithful appearance of the monthly coal bill impresses on us the fact that the first cost of the heating plant confronts us only with the constant problems of heating efficiency, heat-control and fuel-economy.

The hot-air furnace, the hot-water plant and the steam-heating installation are conducting a battle royal for the favor of the consumer. Each type of heating has its advocates. The hot-air champions claim simplicity of operation, ease of control and low first cost, and, in addition, the possibility of introducing a fresh-air mixture at will. The hot-water adherents send out their illustrations of three buckets of coal used for the three types, the smaller credited to the hot-water outfit. They claim the plant requiring the least attention on the part of the consumer. Advocates of steam-heating plants point out the rapidity of heat-generation and radiation as one of the chief advantages of steam-use.

One of the chief arguments made against steam by its opponents is that steam admitted into the radiators has a constant temperature, hovering round the 200-deg. mark and that in the spring and fall the consumer gets more heat than he needs and is uncomfortable.

Man's ingenuity and inventiveness enable him to overcome all difficulties. The best minds in the steam-heating business focussed their attention on this problem and as a result, the graduated valve was brought into being.

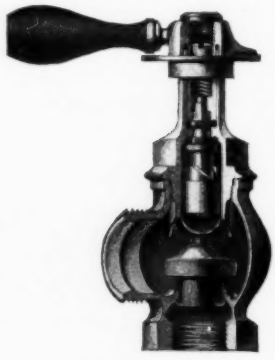
Radiation is proportioned to heat the building in which it is installed to 60 or 70 deg. F. when the weatherman's finger points at the zero on the thermometer. It naturally follows that in milder weather, the radiation will prove to be excessive unless control of the radiation is available. It is impracticable to remove radiation-sections to suit weather conditions. The graduated valve offers itself to the public as a means of heating any proportion of the radiation at will and with as little effort and skill as is required to turn the full amount of steam-supply. The plumber and steamfitter will be interested in the study of some of the leading types of graduated radiator-valves herewith shown. They will offer to him additional means of doing business with customers who are amenable to arguments concerning the economical use of the equipment they desire to select and purchase. It is to be expected that the advent of the graduated radiator-valve will exert a favorable influence on the steam-heating business of the country.

THE TRITON AND LAVIGNE PACKLESS GRADUATED RADIATOR-VALVES.

These two valves of identical construction are manufactured respectively by the United States Radiator Corporation and the Lavigne Mfg. Co., both of Detroit, Mich. They differ in name only, the United States Radiator Corporation calling its product Triton and the Lavigne Mfg. Co. giving its valve its own name. A single description will, therefore, serve for both.

The development of vacuum-heating has created an urgent need for a packless valve. This type of valve may be defined as one whose construction substitutes for the ordinary method of packing around the stem a permanent packing arrangement to prevent, in a positive way, leakage of steam, air or water. Air-leakage is an important problem in vacuum-heating, as in all vacuum-heating systems it is assumed that the space between the radiators and the pipes is practically free from air. Where a pump is operated to maintain a vacuum, air-leakage will greatly diminish its operative efficiency.

In their internal construction, these valves are supplied with a stem of the non-rising type and a flange a short distance above the cam-thread. Between this flange and the inwardly-extending flange of the bonnet, is placed a specially-prepared composition-washer. Another similar washer is placed immediately above the bonnet-flange, and upon this rests a gland-shaped follower-plate, extending from the handle. Inside of this plate is a shoulder supporting a spring which bears upward against a nut screwed to the top of the stem. This spring performs double service, exerting pressure simultaneously against upper and lower washers, holding them tightly against the inwardly-extending flange of the bonnet and taking up automatically any wear

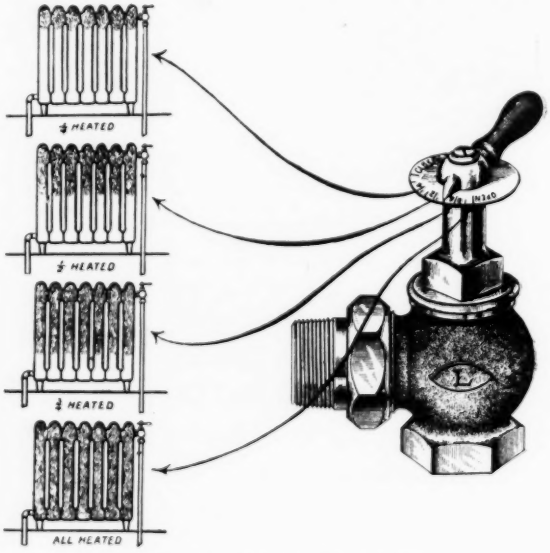


The Triton Valve.

that may occur in either. In this manner an absolutely tight joint against water, steam or air is secured.

The lower end of the stem engages with a cage which is held from rotating by a set of trunnions, which slide up and down in tubular guides. The disc-holder is attached to the cage swivel-joint fashion.

The graduation of steam admission is adapted to a wide range of radiator-sizes, accomplished by four shells, any one of which may be attached to the disc-holder below the disc. These shells have one, two, three and four slots, respectively, the number of slots to be used



The Lavigne Valve and Installation.

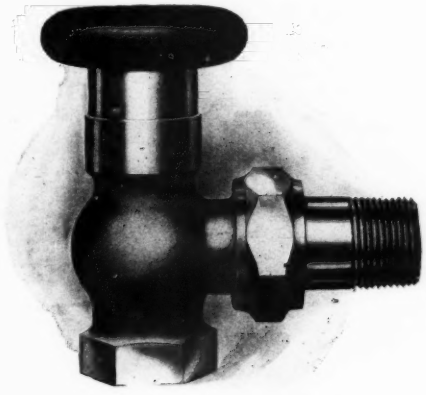
being determined by the size of the radiator to be served.

The valve in its turning provides for the admission of steam to the radiator sufficient to heat it to a quarter of its radiating-surface, a half, three-quarters, or its entirety. The graduation-plate indicates these four di-

visions by numbers with a line between each dividing the graduated arc into eighths, and placing the indicative pointer between these marks will give heating-control to sixteenths. Both companies furnish literature on the construction and operation of these valves, which will be sent upon application by our readers.

THE "ADSCO" GRADUATED RADIATOR-VALVE.

The American District Steam Co., Lockport, N. Y., will mail to all those interested in heating matters its new bulletin on "The Atmospheric System of Steam-Heating." It describes in an interesting way the development of the idea of supplying steam at ounces-pressure instead of pounds. This idea originated in 1877, and was applied at that time in connection with the first central station steam-heating plant, which was installed at Lockport, N. Y. The American District Steam Co. has developed this method of heating until it is now adapted to all classes of buildings. In individual-boiler installation the pressure is controlled by a combined damper regulator and relief valve. Steam is supplied to the radiator at the top through a specially constructed valve known to the trade as the "Adsco" graduated radiator valve. By means of this valve steam can be introduced into any desired portion of the radiator up to approximately 85 per cent. of its total radiating surface, according to the amount of heat required. The remaining portion of the radiator is used as hot-water radiation, and the water of condensation is drawn away through the return piping through an ordinary union elbow. The return piping contains no steam and requires no covering, but is simply grouped into a main return and connected into an open receiver. The bulletin presents many advantages claimed for this system of heating. They include noiselessness of operation, control of heat in each individual radiator, economy of operation, low pressure, quick circulation, and the absence of air-valves and traps on radiators. The bulletin is well worth reading, and can be obtained upon application. When writing mention "Domestic Engineering."

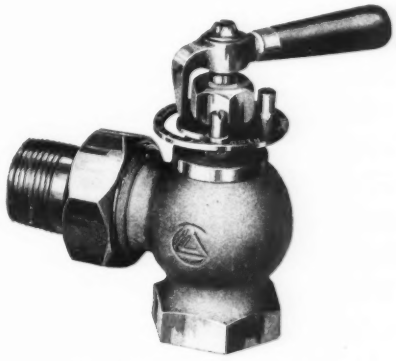


The Adsco Valve.

THE DETROIT FRACTIONAL VALVE.

The Detroit fractional valve is manufactured by the Detroit Lubricator Co., Detroit, Mich. It is used on vapor or steam-heating systems of low pressure. The opening in the shell, which takes the place of the disc on the ordinary steam-valve, is graduated to correspond with divisions marked on the indicator-plate. Any desired amount of steam may be admitted to the radiator by turning the valve-handle until the indicator shows that the opening is of the desired size.

The indicator-plate is marked "Open" and "Shut." It has intermediate divisions. An adjustable stop with set screw may be so set that the valve cannot be opened beyond a certain point. This is advantageous in that it permits the plumber and steam-fitter who is installing the system to make exactly the adjustment called for by the individual requirements of that particular job. The Detroit fractional valve is well designed and well made, all its trimmings being polished and nickel-plated all over. It is furnished with a union, a right-hand thread on the union and a right-hand thread on the bonnet. It is made in ½, ¾, 1, 1¼, 1½ and 2-in. sizes.

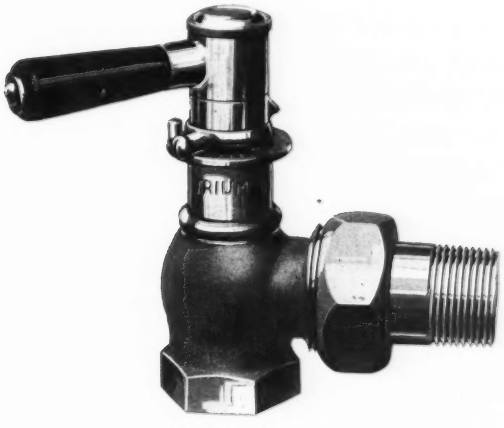


The Detroit Fractional Valve.

THE TRIUMPH PACKLESS GRADUATED RADIATOR-VALVE.

The Triumph packless graduated radiator valve is of a plug type, having an opening shaped so as to obtain anything from zero to the full opening by the movement of the lever-handle.

The stem operating the regulator is seated in the top of the valve, similar to the company's angle-valve. This forms a ground joint, making the valve absolutely leakless and packless, and also self-grinding. The adjusting-nut, which adjusts the spring on the handle-holder to a predetermined pressure, holds all parts from the 45-deg. seat on the stem and upwards, in perfect contact. The handle-holder is changeable to four different positions, without causing any change in the graduating part or indicating of the valve when once set. The Triumph valve has been specially designed for vapor and vacuum work. This valve is the product of the Triumph Valve Co., Mansfield, O., successors in name only to the Safety Cylinder Valve Co. The name of the firm has been recently changed, the officers remaining the same as heretofore.



The Triumph Valve.

AMONG THE WHOLESALERS

PERSONAL MENTION.

Frederick K. Blanchard, 422 River St., Troy, N. Y., has been appointed representative for the Homestead Valve Mfg. Co., of Pittsburgh, Pa., in the Troy and Albany districts. He will carry a permanent stock of the Homestead lines.

SPENCER HEATER CO. TO BUILD LARGE ADDITION.

The Spencer Heater Co., Scranton, Pa., has had plans prepared for the erection of a one-story addition, 40x87 ft., of brick and wood. The addition will be built this fall.

THE McCRUM-HOWELL CO. MOVES ITS PHILADELPHIA OFFICES.

The McCrum-Howell Co. moved its offices in Philadelphia from 142 N. 10th St. to 1108 Walnut St. on October 1st. The new quarters are right in the shopping district and easily accessible by either train or trolley—very convenient for the trade, especially those who wish to bring customers to the show-rooms to see goods or for demonstration.

THE UNITED SEAL CO., COLUMBUS, O., SUCCEEDS THE SAFETY METER SEAL AND PEERLESS SEAL COS.

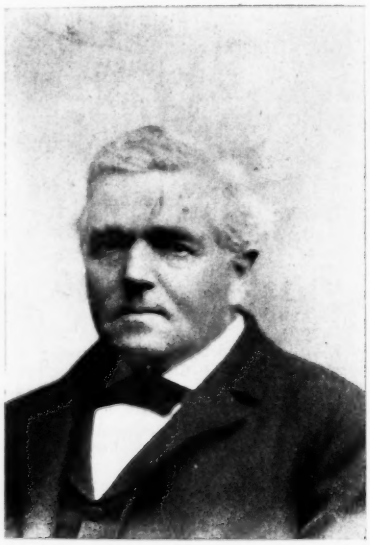
The Safety Meter Seal Co., with offices in the New First National Bank Bldg., Columbus, O., and the Peerless Seal Co., with offices in the Wheeler Bldg., were merged October 1st under the title of the United Seal Co., with a capital of $50,000. Both companies were local concerns manufacturing seals for gas, water, electric and other meters, and both have been doing quite a good business. Being in the same line and covering the same territory, the stockholders of the two companies decided to unite their forces and thus make a stronger company and operate more economically. The officers of the Peerless Seal Co. were: F. R. Main, president; Riley Weinach, vice-president; C. W. Stevens, secretary, treasurer and manager. The officers of the Safety Meter Seal Co. were: Frank J. Macklin, president; W. B. Goodwin, vice-president; C. A. Hayes, secretary and treasurer.

THE FALL-MEETING OF THE NATIONAL ASSOCIATION OF BRASS MANUFACTURERS.

The National Association of Brass Manufacturers held one of its most successful fall-meetings at the Hollenden Hotel in Cleveland, O., on Wednesday, September 20th. The meeting was preceded by a dinner tendered by the commissioner, Wm. M. Webster, to local Cleveland and visiting members, in the private dining-room of the Hollenden on Tuesday evening, September 19th, at which trade matters of general interest and items looking to the general welfare of the trade and the organization were discussed in a heart-to-heart manner. The next day the general meeting was held, during which new members were elected and conditions in the trade reviewed. While in some cases the range of prices was low, and lower than they usually are, and in this way unsatisfactory, the majority seemed to feel that the volume of business was keeping up very well with last year and some reported it equally as good, with a fair demand and with prices equal to those of a year ago, and generally speaking that the business was quite satisfactory. The association adjourned to meet again December 13th and 14th in New York City, which will be the annual meeting.

DEATH OF J. ADAM HELFRICH.

We regret to announce the death of J. Adam Helfrich on September 26th at 3 a. m. Mr. Helfrich was one of Evansville's most prominent business-men. To few men are given the privilege of rounding out a lifetime of usefulness as completely as in Mr. Helfrich's case. For 79 years his life was exemplary as a husband, father and citizen. He was born on January 22, 1833, at Wuerzburg, Bavaria, and came to this country when six years of age with his parents, who settled in St. Joseph, Vandeburgh County, Ind. An 80-acre tract of land was acquired and his early life was agricultural. In 1861 he disposed of his farm and with a portable saw-mill engaged in the work of sawing farm-house and barn patterns. In 1863



The Late J. Adam Helfrich, Evansville, Ind.

he located with his mill permanently in Evansville, forming a partnership with the late J. C. Rechtin. The business continued for 20 years. In 1885, the partners having separated, Mr. Helfrich erected a modern brick planing-mill. Mr. Helfrich was the founder of the following business enterprises, all of which were thoroughly successful: The Evansville Pressed Brick Co., the Helfrich Brick Co., the Bunker Hill Flouring Mill, the Helfrich Lumber & Mfg. Co., the National Pottery Co., the Helfrich Pottery Co., the Peerless Seat & Tank Works, and the Peerless Selling Co.

Mr. Helfrich always took a deep interest in the civic affairs of his home city, having pronounced views on municipal matters though he was averse to holding pub-

lic office, the opportunity for which was offered him several times in the course of his career.

Mr. Helfrich is survived by seven children, his wife having died a year and a half ago. He was a big man, and enjoyed the respect of all his friends, especially his employees.

Since the Helfrich estate entered into the manufacture of plumbers' supplies, Mr. J. Adam Helfrich has led a rather retired life, being only consulted in matters of importance. The management of the estate has been for a number of years in the hands of his son, Michael D. Helfrich. The National Pottery Co., the Helfrich Pottery Co., the Peerless Seat & Tank Works and the Peerless Selling Co. are all controlled by the Helfrich estate. The Peerless Selling Co. advises us that there will be no change in the business policies or interruption of the companies' varied enterprises due to Mr. Helfrich's demise.

HANDSOME DISPLAY AT MILWAUKEE.

Early in September, the Merchants & Manufacturers' Association of Milwaukee made a splendid display of Milwaukee-made goods. Thousands of people in that city learned for the first time that Milwaukee had more than one product to make it famous. One of the most convincing proofs of this was the display made by the Hoffmann & Billings Mfg. Co., Milwaukee, Wis. The features of the display were a general line of plumbers' brass

The Attractive Exhibit of the Hoffmann & Billings Mfg. Co., Milwaukee, Wis., at the Recent Exposition in that City.

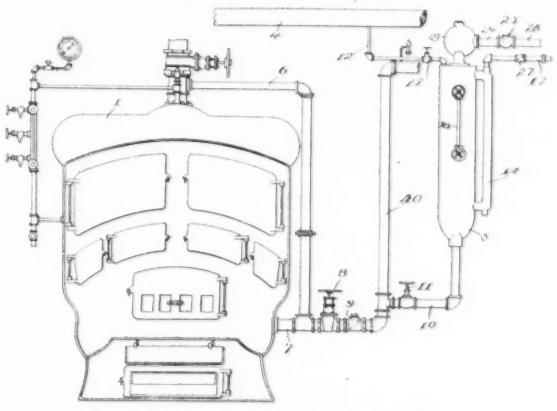
work and special shower and shampoo fixtures equipped with the Niedecken mixer. The porcelain bath shown is fitted with the company's new-style combination shower and bath filler with a Niedecken mixer, all concealed.

The fixture, mounted on a stand in the center of the display, was especially designed for the new Buckstaff Baths at Hot Springs, Ark. These fixtures are remarkable for their immense size and also for their combination of bath-filler and Niedecken mixer to meet the requirements of patients receiving hydrotherapeutic treatments.

The Hoffmann & Billings Mfg. Co. has recently secured the contract to furnish over 700 Niedecken mixers to be installed in the Statler Hotel, now being built at Cleveland, O. Of these, 360 will be of combination type used in connection with built-in porcelain tubs, and 350 with showers only. In all probability, the manufacturers are justified in claiming that this will be the largest shower-installation in the world.

THE SIEBENMANN VACUUM SYSTEM OF HEATING.

F. E. Siebenmann, Denver, Colo., is calling the attention of the trade to the meritorious features of his vacuum system of heating. In installation and operation it will be noted by a study of the illustration that the exhauster at 5 is connected to the return-pipe from the heating system (40) by means of the exhauster supply-pipe (10), through which pipe a part of the return-water from the heating system is fed to the exhauster up to the water-line. The water-line in the exhauster is the same as the water-line in the boiler, that part of the exhauster above the water-line being reserved for the vacuum space. The return-water comes back to the boiler at a slightly lower temperature than the boiling point, thus when it is admitted to the exhauster it ex-



The Siebenmann Vacuum-Heating System.

pels a vapor which is condensed, not by cold water, but by the difference in the temperature of the exhauster-walls and the cold air coming into the exhauster from the radiators and piping. The inventor claims that thus a vacuum is created, which draws the air from the radiators and heating pipes, the operation of the exhauster being therefore automatic and without cost.

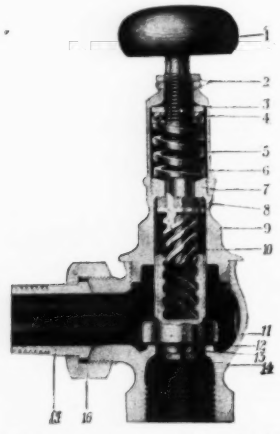
The exhauster requires neither steam nor water-pressure, electric current nor cold water to condense steam with, in order to create the vacuum whereby the air is drawn into the exhauster. The inlet and discharge-openings are made in proportion to the amount of radiation served thus totally avoiding back-pressure at any time during the operation of the heating system in the air-lines. Briefly stated, with the Siebenmann system, a part of the return-water from the heating system is admitted into the exhauster, the vapors of which are condensed, thus creating the vacuum, by means of which the air is drawn into the exhauster. Mr. Siebenmann states that over 400 installations of this kind are in operation satisfactorily. He will be glad to furnish additional information to readers of "Domestic Engineering."

NEW WORK ON REINFORCED CONCRETE.

"The Practical Design of Reinforced Concrete Beams and Columns," is a work just issued by Whittaker & Co., 64-66 Fifth Ave., New York City. The author is W. Noble Twelvetrees, who has already produced well-known works on "Structural Iron and Steel," "Concrete-Steel," and concrete calculations. The present work effectively supplements previous treatises on concrete-construction by presenting a complete series of formulæ for the particular design of beams, slabs, columns and struts, members which enter largely into engineering and architectural structures of almost every class. Simple working rules and labor-saving diagrams are presented in abundance. Chapters I to V deal with the design of rectangular and T-beams with different reinforcements; Chapter VI is devoted to web reinforcement; Chapters VII and VIII treat of the design of columns and column-bases; Chapter IX comprises a set of fully worked calculations for floor, and Chapter X contains a summary of working stresses. To engineers who are confronted daily by problems in concrete-construction, the book will prove of great assistance. It can be obtained from the publishers for $2 net, or from the Book Department of "Domestic Engineering."

THE DOLE PACKLESS RADIATOR VALVE.

What was once known as the "E. P. Allen" ball-bearing packless radiator valve, is now known as the Dole packless radiator valve. The Dole Valve Co., 22 Fifth Ave., Chicago, in a neat booklet presents the points of superiority of the Dole valve under 16 heads. An enumeration of the chief of these is interesting. The wooden handle is



The Dole Packless Radiator Valve.

a patented article, of shape conformable to the hand of the user. A double locknut prevents accidental compression or loosening of the seat. There is an upper bearing for balls, which is adjustable and prevents the loss of tension in the spring. The spring is spiral, of steel, and gives a 75-lb. tension. Below the spring, which is encased in a dust-proof nickel cap, the reader will note a double shoulder structure, which is designed to prevent leakage of air and water. Below these is a packless disc of special composition. The stem is one piece. The valve body has extra-heavy standard threads and is composed of the best steam metal, and the tail-piece is built to make up absolutely tight.

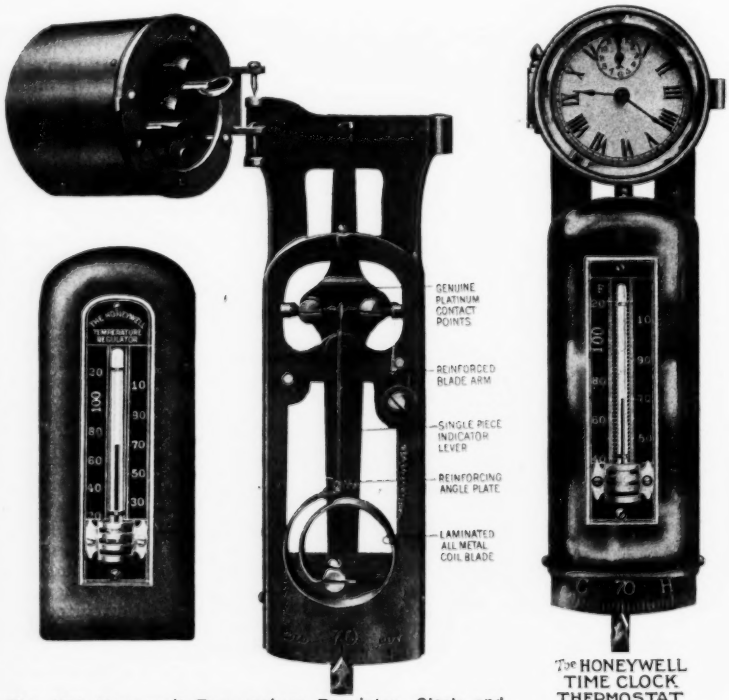
The ball-bearings ensure durability and ease of operation. Many a valve-handle is broken by trying to force it open after it has remained closed any length of time. The Dole valve, through its ball-bearings, cannot be set down so tight but that a child can open it. Considerable attention has been given to the composition of the packless disc. In one test, one of the one-inch valves on a direct steam-pressure was opened and closed 1,000 times, showing no perceptible wear at the end of the test. The seat-disc is one of the most vital and important parts of valve-construction, and the manufacturers conducted a series of experiments to secure a composition which will render it wear-proof and consequently efficient under conditions of operation. Copy of this booklet containing a detailed description may be obtained upon application. When you write, mention "Domestic Engineering."

THE 1911 HONEYWELL TEMPERATURE REGULATOR.

The Honeywell Heating Specialty Co., manufacturers of the well-known Honeywell heat-generators and hot-water radiator-valves, are introducing to the trade a 1911 type of temperature-regulator which is an improvement on the previous temperature-regulator known as the 1910. The motor remains the same, but the thermostat has undergone many changes. The changes apply not only to the construction but to the character of the materials used. An all-metal coil-blade has been introduced, which is made from material imported direct from Germany. The contact points are of platinum. The adjusting mechanism has been reduced to the simplest possible form, with few moving parts, and therefore less liability of getting out of adjustment.

By a very simple hinge-arrangement, the clock is made detachable, yet it is so arranged that the clock will not drop from its hinge when open. The company is issuing a booklet of nearly 100 pages, which instructs architects,

No. the Dole Packless Radiator Valve Was Not Installed Here.


GENUINE PLATINUM CONTACT POINTS
REINFORCED BLADE ARM
SINGLE PIECE INDICATOR LEVER
REINFORCING ANGLE PLATE
LAMINATED ALL METAL COIL BLADE
The HONEYWELL TIME CLOCK THERMOSTAT

The 1911 Honeywell Temperature Regulator, Clock and Cover Detached.

engineers and steam-fitters in the proper design and installation of the Honeywell hot-water heating system, and devotes a special chapter to the temperature-regulator. Its construction and operation are illustrated and described, and the booklet should be of interest to those who desire to become acquainted with all the possibilities of successful heat-producing apparatus. The temperature-regulators are sold principally through the jobbing-trade, and they are sold with an unconditional garantee. Copy of the booklet can be obtained upon application. Kindly mention "Domestic Engineering" when writing.

MANY PLUMBERS BUSY WITH WATER-SUPPLY INSTALLATIONS.

The accompanying illustration represents only part of a one-day shipment from the plant of the Leader Iron Works at Decatur, Ill. Besides the systems loaded on cars at the factory, which are sent to all parts of the country, there are numerous small outfits being built and delivered to the railroad stations by wagon.

The two 5x26 ft. pneumatic tanks shown on the first car are on their way to the State College of Agriculture at Jonesboro, Ark. The weight of each of these tanks is between three and four tons, and the capacity 3,800 gal. The large working head is operated by a 6 h.-p. gasoline engine.

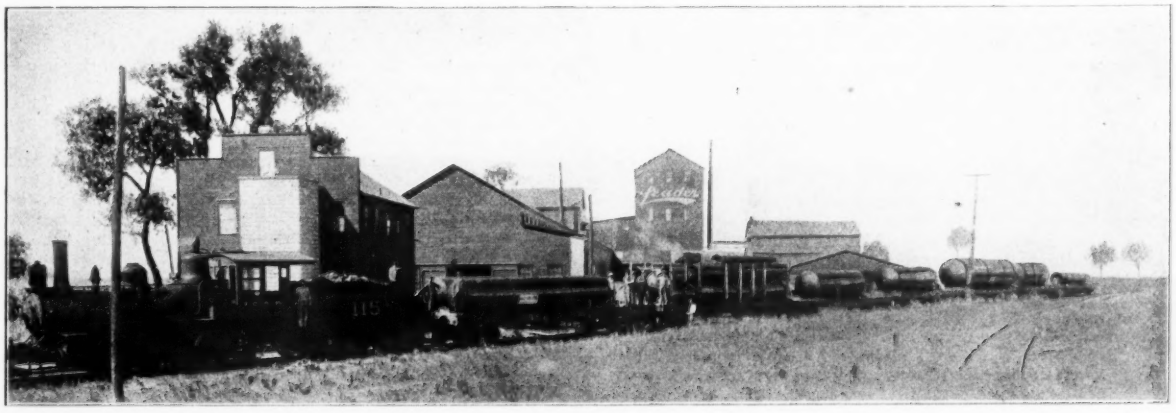
The large tank shown on a car near the rear end is being sent to the Lincoln Institute at Simpsonville, Ky., a new state industrial and agricultural school for colored people. This tank weighs 10 tons, is 8x36 ft. in size, and has a capacity of 13,500 gal. It is only part of a complete plant, which includes a 12 h.-p. electric motor, a 12 h.-p. Leader domestic gasoline engine, and a pump having a capacity of 2,400 gal. per hour.

Two of the large tanks shown above are to be installed by a plumber at Hoyleton, near Centralia, Ill., for an orphanage at that point. Included in this equipment are a pump having a capacity of 1,300 gal. per hour, and a 2 h.-p. Leader domestic gasoline engine for operating same.

Two other large tanks, each 7x22 ft., go to Meservey, Ia., where they will be used to supply running water for domestic purposes and fire protection.

One of the tanks shown is being started on its way to a large farm at Troy, Mo. This tank is 6x22 ft., and weighs 7,000 lb.

A factory at Cotton Plant, Ark., will be supplied with fire protection by an automatically controlled electric driven outfit, using a tank 6x20 ft.



A One-Day Shipment of Water-Supply Systems from The Leader Iron Works, Decatur, Ill.

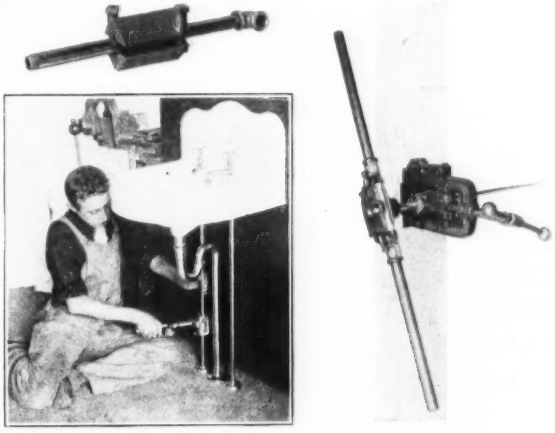
One 7x22 ft. tank will go to a county farm in Michigan, and will be installed by the local plumber.

The large carload of smaller tanks is on its way to the southwestern distributing connection at Kansas City, and will be reshipped from there to local plumbers.

The day that the above shipment was made orders were in the factory for large equipments that would require six additional flat cars to transport them. This shows that the plumbers over the country are taking hold of the water-supply business for large institutions, county farms, country clubs, hospitals, and even small towns and villages. It shows that the trade is awake to the opportunity offered in this line.

A NEW NON-SLIPPING PIPE-CLAMPING DEVICE.

The Mummert-Dixon Co., Hanover, Pa., is placing before the plumbers of the country a pipe-clamp device, herewith illustrated. It is made especially for the purpose of



A New Non-Slipping Pipe-Clamping Device.

holding plated, enameled, lacquered or polished pipe. It is claimed that it will firmly grip the pipe without any danger of slipping or peeling of the polish or lacquer. No noticeable mark is left on the pipe, as the gripping edges of the clamp are parallel to the pipe-length, the contact-edges being so sharp that any slight impression made is almost imperceptible.

The gripping edges of the jaw are very long and this does away with the necessity of any hard clamping, the necessary grip being obtained through this additional frictional area.

In use, the clamp is placed on the pipe far enough from the cutting point to allow the die-stock to go over and draw up the clamp-nut with the pliers or a small wrench. The clamp is then placed in a pipe-vise or flat vise. The clamp can also be used for placing the pipe in position, by using either a monkey or a stillson wrench. This pipe-clamp is made of good material with hardened edges, so it is very durable. It is compact and convenient for the tool-kit. The size is about 1½ in. square by 3 in. long, and it will accommodate the pipe from ⅛-in. to ¾-in. inclusive. Further details concerning this pipe-clamp can be obtained upon application to the Mummert-Dixon Co. Mention "Domestic Engineering" when writing.

TRADE LITERATURE RECEIVED THIS WEEK.

The Smooth-On Mfg. Co., Jersey City, N. J., is issuing a four-page circular in two colors which shows the difficulties that Father Time has in trying to make an impression on Smooth-On gaskets. The circular contains an interesting reference from the De Lamar Copper Refining Co., Chrome, N. J., which installed 614 Smooth-On gaskets in May, 1906. In May, 1911, the company had yet to make record of its first leak. Heating engineers interested in products designed to do away with leaky joints, will find it to their advantage to write for one of these circulars. In doing so, mention "Domestic Engineering."

The Humphrey Co., Kalamazoo, Mich., has just published its August edition of the Humphrey "Herald." The leading article tells how every plumber can become a first-class salesman of the Humphrey water-heater, and the issue also contains several good ideas on the advantageous utilization of window space. Those interested can obtain copy of the Humphrey "Herald" upon request. When you write, mention "Domestic Engineering."

The Sanitary Mfg. Co., Hamilton, O., is issuing a neat little booklet illustrating and describing its "Can't-Break" seat. These seats, in addition to being joined by tongue and groove, are clamped by long steel bolts which are concealed. The "Can't-Break" seats are made in a number of finishes and conform to market requirements. The specific points of merit in their construction are clearly set forth in the booklet, copy of which can be obtained upon application to the company. In writing mention "Domestic Engineering."

Warren Webster & Co., Camden, N. J., is mailing to the trade two booklets of interest to steam-heating engineers. One contains a fully illustrated description of the modulation system of steam-heating in the Sumner apartments at Newton Centre, Mass. The other is entitled "An Insurance Policy on Your Heating-System," which is an exposition of the five principal reasons why the company should be selected to install the heating-plant required by the reader. This booklet contains a number of handsome illustrations of many of the large jobs installed by the company. Both of these can be procured upon application.

THE OFFICIAL RECORD OF THE GALVESTON CONVENTION ISSUED.

The proceedings of the 29th annual convention of the National Association of Master Plumbers have just been issued in book-form from the headquarters of the organization at Canton, O. The book contains a complete report of the convention held at Galveston, Tex., June 13, 14 and 15, 1911, including the valuable address on "Profits and Costs in the Plumbing Business," by S. H. Morgan, Detroit, Mich., and the essays on vital plumbing questions presented at the convention by T. J. Ryan, Springfield, Mass.; John L. E. Firmin, San Francisco; Andrew Young, Citronelle, Ala.; W. W. Hughes, Minneapolis; B. Joseph O'Donnell, Syracuse, N. Y.; David Whiteford, Chicago; A. F. Bellingrath, Atlanta, Ga.; H. F. Baillet, Newark, N. J.; John E. Dugan, Albany, N. Y.; J. J. Cosgrove, Philadelphia; and T. C. Boyd, Chicago. It will thus be seen that the book will be of great value and interest to master plumbers whether or not they were fortunate enough to attend the convention. An excellent half-tone likeness of President Alfred C. Eynon serves as frontispiece. The book consists of 244 pages, 5½x8¼ in.

THE BECKER MILL SOUVENIR.

The Becker Mill Co., Marietta, O., is mailing to the whole trade a handsome and useful souvenir as an efficient means of advertising the company's "Hercules" seats. Wrapped in its tissue-paper, it feels like a cake of soap. When uncovered, it reveals a concentrated presentment of good material and workmanship that typifies the company's product in a most attractive and forceful way. Its material brings immediately to mind the powerful trees of the forest from which it came. Its glossy finish savors of the precious gems of the Orient. Its perfect edges and rounded corners tell the story of up-to-date factory-equipment, vigilant supervision, skilled operatives and manufacturing pride. Have you guessed what it is? Well, it's a paper-weight which will prove an ornament to any desk or table. If you have not already received it you can receive one by applying immediately to the company. Tell them you read about it in "Domestic Engineering."

TWO NEW BOOKS ON DOMESTIC SANITATION AND PLUMBING.

Only a decade ago we were bewailing ourselves that sanitation was weak in literature. The present and future student of sanitary matters will no longer be able to cover up his ignorance on the ground that sanitary knowledge was not available. The two latest contributions to the sanitary literature of the world are, "Elementary Science" and "Domestic Sanitation and Plumbing."

The author of these is A. Herring-Shaw. Mr. Herring-Shaw is an Associate of the Royal Sanitary Institute, a lecturer on sanitary matters, and chief assistant in the Municipal and Sanitary Engineering Department, School of Technology, Manchester, England.

"Elementary Science" deals with scientific things and facts as applied to sanitation and plumbers' work. It is in its second edition. It is essentially elementary, so that the student of sanitary matters can take up the study of the various chapters without having more than an ordinary education. Furthermore, all the various problems presented are applied directly to plumbing and sanitary practice. The book contains, in fact, specific information only found ordinarily through the study of a number of books along different scientific lines. It commences with a presentation of arithmetical signs, tables and geometrical values, treats with physics in a comprehensive way for ten chapters, and concludes with seven chapters on chemistry. It is an excellent book and should be considered indispensable as an encyclopediac reference.

"Domestic Sanitation and Plumbing" is a treatise of the materials, designs and methods used in sanitary engineering. It is published in two volumes. The first deals with the materials and their uses; soil, waste and vent-pipes; sanitary fittings; house-drainage; cess-pools and disposal of house-sewage. These subjects are accompanied by over 300 illustrations. An interesting part of the book is devoted to traps of different types. Chapter IX is given over entirely to consideration of the different forms of water-closets.

In Part II, essential attention is given to water supply; domestic hot-water service; warming and ventilation of buildings. The important principles and details throughout the work are illustrated by numerous diagrams, drawings and sketches in both volumes. The subject-matter is handled on organized and progressive lines. Coming as they do from England, these two works manifest their origin here and there by illustrations of English fixtures and English terms for certain fittings. This, however, does not detract from the value of the books in any degree. It rather enables one to make advantageously an interesting comparison between the English and American types. "Elementary Science" can be obtained for $2.00, and "Domestic Sanitation" for $5.00 for the two volumes, these prices being net. These books can be obtained from the publishers, D. Van Nostrand Co., 23 Murray and 27 Warren Sts., New York City, or from the Book Department of "Domestic Engineering," 443 So. Dearborn St., Chicago.

A GOOD CATCHER.

The plumber's future successor and pride of the family kicked one foot uneasily against the other, as he saw his teacher was about to ask him a question. "What is the devil?" asked the teacher. Tommy replied: "I don't know what it is but it can't run as fast as Pa can." "What do you mean?" queried the instiller of knowledge. "Well, Pa says he catches the devil every time he comes home late from the plumbers' monthly meeting. I expect I'll be able to do that when I grow up, won't I, teacher?" "There's no doubt about it," said the teacher, dryly.

"That man drinks like a fish."

"Why, I was told he never touched a thing but water."

"Neither does a fish."—Baltimore American.

NEW ENGLAND NEWS.

Massachusetts.

Adams.—Bernard and Thomas Haggerty were discharged when arraigned in the local court charged with doing a plumbing business without the proper license. It was shown that they were working under a license granted their predecessors, Haggerty & Bowe, and this the court considered as binding.

Springfield.—The supreme court may be called in to decide as to the constitutionality of Springfield's plumbing regulations as the result of the case of the City vs. George J. Mulligan. Mr. Mulligan is charged with allowing a journeyman in the employ of his firm, G. J. Mulligan & Co., to do certain work subject to inspection by an authorized plumbing inspector, while he, Mulligan, was not licensed as a master plumber. It is claimed that he violated that provision of the regulations which says that one journeyman plumber may not hire another to do plumbing work. Mulligan's attorneys claim such a law deprives a man of his constitutional rights.

Athol.—The work of renovating the heating system at the Main street school-house has been awarded to the Jennison Plumbing Co. of Fitchburg. The work will cost about $2,000.

Manchester.—Edward S. Bradley, the Central street plumber, has incorporated his business under the Massachusetts laws and henceforth will do business as the E. S. Bradley Co. The officers are: E. S. Bradley, president and treasurer; W. H. Allen, secretary; Mrs. Annie J. Hollins, director. The new company is capitalized at $20,000 and will do a general plumbing and heating business. It will continue at the same location.

Lowell.—P. F. Welch has the following heating contracts in hand: two new houses on Hawthorne street for C. P. Witham; house of Russell Fox, Beacon street; house of Oskar Gray, Linden street; house of John J. Higgins, Andrews street. Mr. Welch also has the contract for plumbing a four-apartment house which Michael Murphy is erecting on Charles street.

Stockbridge.—Several citizens of this town have banded together and engaged an inspector to look after sanitary conditions in the village and to keep an eye on plumbing work.

Attleboro.—The board of trade has given its approval to the location in this town of the plant of the Sawyer Down Draft Heater Co. The board sent a committee to Boston to investigate the workings of the system.

Maine.

Bangor.—Bids for steam heating in the temporary school building which is being erected on Palm street have been received and the contract awarded to the Maine Plumbing Co. There were four bidders.

Connecticut.

South Beach.—Archie F. Lawrence has been awarded the contract for plumbing and heating the building being erected on Shore avenue for J. B. Henry. The house will be heated by steam and the plumbing will be modern in every detail.

Waterbury.—The contract for plumbing and heating the new rectory being built on Willow street for St. Margaret's church has been awarded to Charles Thatcher Co.

New Haven.—With the beginning of the new year the plumbing inspectors of this city, who have been hitherto connected with the board of health, will be placed under the supervision of the building inspector as the result of a bill passed by the legislature. New Haven officials are not exactly pleased with the new law and declare it to have been a political arrangement.

Vermont.

Burlington.—The G. S. Blodgett Co. has the contract for installing the heating system in the new office building which is being erected in the town of Proctor for the Vermont Marble Co.

Rhode Island.

Pawtucket.—The journeymen plumbers in this city have agreed to take up the matter of instructing apprentices, and a series of talks is being arranged for their benefit. In this way it is hoped to give the apprentices a better understanding of the trade and assist in turning out expert workmen.

NEWS FROM PITTSBURGH.

With the commencement of the fall season, plumbing and heating contractors in the Pittsburgh district are finding business rather spasmodic. One week it is good, the next week there is little if anything doing. The last summer has not produced any really large heating or plumbing contracts for Pittsburgh firms, although all have managed to keep more or less busy.

Just now interest is being centered in plans prepared by I. K. Watkins, of the Columbia National Bank Building, who contemplates erecting 33 hollow-tile and plaster bungalows at an approximate cost of $10,000 each. These homes will be built within the county and will be two and one-half stories in height. They will be heated by steam and piped and wired for both gas and electricity, with two bath-rooms in each.

The McGinnis-Smith Co. has been awarded the steam and ventilating systems which will be installed in the Mt. Washington school, a contract worth about $8,000. In addition to this, the company has been awarded the heating contract in the New Castle high school for $4,800, and the heating and ventilating in the new Christian church at East Liverpool, O., at a cost of about $2,000.

One of the large steam-heating contracts placed during the last fortnight was that let by the St. Luke's Lutheran congregation of the Northside, which was awarded to the Pittsburgh Heating Co.

The Reliance Heating Co. was awarded the heating system to go into the new business block on Wabash avenue, which is being erected by C. R. Metzgar. This company also has the contract for the heating system in a new residence being erected by Dr. J. O. Bockstoe.

Plumbing in the new $25,000 garage being erected by Howard Heinz, of the "57 Varieties" fame, will be done by the Knoxville Plumbing Co.

The Board of Education of Washington, Pa., has given the heating and ventilating contract for a new school to the American Warming & Ventilating Co. This company has also been awarded the heating contract in the new $50,000 high school building at Freedom, Pa.

Although Pittsburgh plumbing and heating contractors sought the work, the James L. Stuart Contracting Co., of this city, which is erecting the new Statler Hotel, in Cleveland, awarded the heating contract to the Chafer Co., and the plumbing to Dewstoe & Brainard, both of Cleveland. This hotel will be 12 stories in height and contain 750 rooms, all of which means one of the biggest contracts in the heating and plumbing lines here in the year.

RECENT CONTRACTS.

Among the plumbing and heating contracts let in the Pittsburgh district recently are the following:

Steubenville, O.—Frank Murphy, who is erecting a store-room and office-building, gave the plumbing work to A. H. Helm & Sons.

Canton, O.—L. B. Ohlinger gave the heating installation in his new apartment-building to J. Mills & Co.

Toledo, O.—Plumbing in the new $100,000 market house being erected will be done by Wacker & Jackson.

Aspinwall, Pa.—G. W. Bliss gave heating contract for his new residence to the Reliance Heating Co.

Braddock, Pa.—Notice has been given that the partnership which has been existing between Samuel H. Marshall and John R. Hayne, plumbers, has been dissolved. Mr. Marshall has retired from the firm.

SALT LAKE CITY MASTER PLUMBERS BEGIN WORK ON PROGRAM FOR THE NEXT NATIONAL CONVENTION.

The Master Plumbers' Association of Salt Lake City, Utah, has started actual work on the program for the thirtieth annual convention of the National Association of Master Plumbers, to be held in that city next summer. Before the first of the year a rough outline of all the entertainment features will be in shape, and the remaining six months will be given over to perfecting the details. While the date of the convention has not been definitely fixed, it will be held in the month of June, probably during the latter part.

In a letter to officials of the local organization, Alfred C. Eynon of Canton, O., president of the national organization, writes: "I personally look for a great outpouring of our people, and predict one of the largest conventions in the history of our organization."

NEWS FROM SALT LAKE CITY.

The P. W. Gorman Plumbing Co. has landed the heating contract for the new Farmington school and is finishing up the plumbing and heating on the elegant mansion of Col. Wall, located on Brigham street.

The Higson-Rossiter Plumbing Co. is installing the plumbing and heating in the Uintah school at a price of $12,000; also in the Wasatch school at a cost of $4,000. This firm also has the contract covering the overhauling of the plumbing in the Templeton office-building.

The Carthey & Dumbeck Plumbing & Heating Co. is employing a large force of men installing the plumbing and heating in several new barracks and officers' quarters at Fort Douglas.

The Wright-Osborn Plumbing Co. is finishing the plumbing and heating on the Canning apartments, one of the largest apartment-buildings in the city. They also are doing the work on the Perry Heath building and the Houston block. This firm also has a number of very fine out-of-town contracts.

The Will Rees Plumbing Co. has just completed the plumbing and steam-heating systems in the eight-story McIntyre office-building.

The I. M. Higley Co., now succeeded by the Higley-Dudley Plumbing Co., is quite busy on some nice day-work contracts.

The James & Obray Plumbing Co. is completing the plumbing on the new Walker building, located at Main and Post-Office Place.

Pomeroy Spencer, the heating and ventilating engineer, has lately finished the heating on the Felt office building and is nearing the finish of his contract for the steam-heating on the Walker building.

The Reeve-Pettit Plumbing Co. has landed the contract covering the plumbing and heating for the new County Infirmary at a figure of $12,000.

The Green Heating & Plumbing Co. is finishing the heating-plant of the new $2,000,000 Utah Hotel.

The trade outlook in this neck of the woods is very encouraging and Utah architects were asked to submit plans in competition, not to be in later than the end of September, in connection with the erection of the new $4,000,000 State Capitol building to be erected in this city.

The excavation work for the foundation of the new $2,000,000 high-school building is being rushed, as is also the concrete work on the $500,000 department-store of F. Auerbach & Bro.

Walker Bros., bankers, who control the oldest banking institution between the Missouri River and the Pacific Coast, have let contracts for the erection of their new 16-story office-building. This structure will have an immense tower surmounting it, making it the highest building in this section of the country.

MUNICIPAL HONORS FOR A PLUMBER.

W. W. Hughes, of the Hughes Plumbing & Heating Co., 1524 E. Franklin Ave., Minneapolis, Minn., has been given a municipal boost. The city of Minneapolis has been trying for several years to secure for itself a home-rule charter, and to that end three commissions have prepared charters, but all of them were rejected by the people. A fourth commission has now been appointed to prepare a charter to be submitted at a special election to be held early in 1912. The commission is composed of 15 members, and W. W. Hughes has been selected as one of the 15. The judges of the District Court, who made the choice, are credited with having said that it would be advisable to place a plumber on the commission, with the idea that he might possibly be able to make a proper kind of a joint to unite the voters and the charter, thereby securing its adoption. Mr. Hughes is the right man in the right place, and we feel confident that the commission will profit by his appointment. At the same time, it will assist him in acquiring a deal of information about municipal affairs which will prove invaluable in years to come, invaluable not only to Mr. Hughes but also to his associates in the plumbing and heating trades, for Mr. Hughes believes in handing information out as well as in acquiring it. We wish him every success in his new dignity.

CONTRACTS AWARDED.

Pekin, Ill.—Ruhaak & Lackman have been awarded the contract for the plumbing, heating and ventilating the county-farm buildings. The consideration is $7,800.

Salina, Kans.—The Salina Plumbing Co. has secured the contract for the installation of plumbing, heating and electric-wiring systems at the Western Kansas State Normal school. The consideration amounts to $6,000.

Little Rock, Ark.—Morris B. Sanders has secured the contracts for the plumbing and heating in the following buildings: Little Rock high-school auditorium, Hendrix College annex, Elks' temple, the First Ward fire-station and W. Y. Foster's new residence at Hope, Ark.

Sidney, Neb.—M. Ramella has been awarded the contract for the installation of an up-to-date plumbing system in the new court-house and jail building. Consideration $1,375. C. M. Wright secured the contract for heating this building at $1,785.

Louisville, Ky.—J. E. Gray has secured the contract for the plumbing of the new building which is to be erected at Walnut and Third streets by Judge Wheeler McGee.

Birmingham, Ala.—The Barbour Heating & Electric Co. has secured the contract for the installation of a heating system in the new high-school building now being erected at Ensley, Ala.

Carroll, Ia.—R. I. Hamilton has been awarded the contract for the installation of an up-to-date heating system in the South Side school.

Red Wing, Minn.—Nelson & Metzler have secured the contract for plumbing P. W. Mook's new residence in Zumbrota, Minn.

Paragould, Ark.—The City Plumbing Co. has secured the contract for the plumbing of a new $30,000 hotel at Campbell, Mo.

A Good Reason.

Sunday School Teacher—"Did you ever forgive an enemy?"

Tommy Tuffnut—"Once."

Sunday School Teacher—"And what noble sentiment prompted you to do it?"

Tommy Tuffnut—"He was bigger'n me."

NEWS FROM THE STOLZ PEN AND CAMERA.

George R. Stolz, the popular inspector of plumbing at Milwaukee, Wis., in a recent letter informs us that there is plenty of plumbing work in Milwaukee, but that it is mostly small work. At the present time it is proposed to consolidated the house-drainage department and the plumbing department, as previously announced in "Domestic Engineering." This is, no doubt, desirable, and it may happen in the near future. If it takes place, Mr. Stolz will have under him 11 inspectors and a deputy, and his department will then have full control of all the work, inside and outside, of all buildings. This will work a hardship on the inspectors of the house-drainage department, as it will dispense with eight house-drainage inspectors, some of whom have been in the service a long time. The accompanying illustrations will interest our readers. Fig. 1 is a photograph of all the Milwaukee inspectors at their annual outing at Golden Lake, 35 miles due west of Milwaukee. The boys had a pleasant time for two days, Sunday and Labor Day. The modesty of the Milwaukee inspectors may be gaged by the fact that no reports were sent in concerning the size of the fish they caught. The gentleman on the sand much resembling Venus arising from the sea, is George Stolz. Fig. 2 is a faithful representation of Friend Stolz 11,000 ft. up in the air. In his every-day work he never gets as much up in the air as that. The photograph was taken when he was investigating the possibilities of the plumbing department up in the mountains. Friend Stolz says the water supply is fine, and the big stick in the foreground is doubtless his fishing-rod. Fig. 3 is doubtless a satisfactory explanation of the question, Where do all the plumbing inspectors in the United States come from? By using an extra-large plate, the photographer was enabled to include the entire Stolz family. We will add the photograph to our gallery of large families that we have met.

Fig. 1.

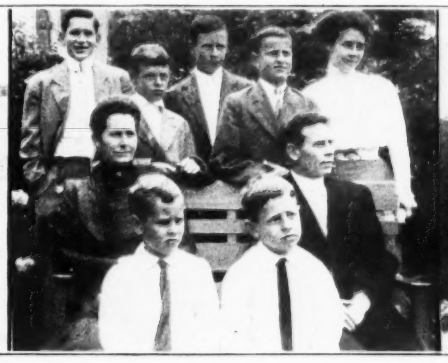


Fig. 2.

Fig. 3.

OBITUARY.

George J. Cope.

George J. Cope, senior member of the plumbing firm of Cope Bros., Hartford, Conn., ended his life by shooting, a few days ago. He had been in difficulties over money matters and had been somewhat despondent, although attending to his business each day. Mr. Cope was 44 years of age and had been in the plumbing business for many years. He is survived by a widow and seven children.

Benjamin C. Litchfield, a resident of Cambridge, Mass., for half a century and one of the oldest master plumbers in the state, died at his home in that city recently. He was 73 years of age and had been retired from active business but a few years. Mr. Litchfield was born in Boston and after leaving the public schools entered the plumbing trade, which he followed the greater part of his life. He had conducted establishments in both Boston and Cambridge. He is survived by a widow, three daughters and one son.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., Oct. 9, 1911, for the construction complete, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Winchester, Ky. The building is to be one story in height with a ground area of approximately 5,000 sq. ft., faced with marble and, except the roof, of fireproof construction.

Until 3 p. m., Oct. 11, 1911, for the construction complete, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Newberry, S. C.

Until 3 p. m., Oct. 16, 1911, for the construction complete, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Point Pleasant, W. Va. The building is to be two stories in height with a ground area of 5,500 sq. ft., of fire-proof construction, with brick facing and stone trim.

Until 3 p. m., Oct. 24, 1911, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Lexington, Ky. The building is to be one story and basement, non-fireproof, brick and stone-faced, of approximately 4,200 sq. ft. area.

Until 3 p. m., Oct. 31, 1911, for the construction complete, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of the U. S. post-office at Florence, Ala. The building is to be three stories in height with a ground area of approximately 6,000 sq. ft., and of fireproof construction with stucco facing and stone trim.

All proposals should be in accordance with drawings and specifications, copies of which may be obtained from the custodians of the above sites or from the office of the Supervising Architect at Washington, D. C.

MASSACHUSETTS MASTER PLUMBERS' SEMI-ANNUAL MEETING.

The Massachusetts State Association of Master Plumbers held its semi-annual meeting and fall outing at Lake Quinsigamond, Worcester. The program called for some business and a lot of enjoyment. Many of the members from other cities made the trip to and from Worcester by automobile. Several matters of importance were considered and discussed, but as the meeting was principally an outing the plumbers did not spend any more time than was necessary indoors. The sports program consisted of ball games, foot-races and similar events.

Wouldn't Take Chances.

Percy—"Lend me five, old chap, and I'll be everlastingly indebted to you."

Reggie—"That's just what I'm afraid of, old fellow."—Pathfinder.

THE METAL MARKET

NO ANIMATION IN THE PIG IRON MARKET.

There is less inquiry than last week, although some inquiries have developed in the market for fairly round lots, but these have been cut in two. Labor difficulties all over the country are responsible for many foundries buying only as their needs warrant and then, too, there is very little incentive to buy for future requirements, as consumers feel sure they can purchase next year as cheaply as they can now and think the market may be even lower. No notable sales have been made, but there is an inquiry in the market from a Pennsylvania railroad covering its pig iron needs for the next quarter of the year, which is considerably larger than usual. This company has found it possible to make many supplies cheaper than it could buy them and at the present dull times, some of the shops are being worked to capacity. Prices are as follows:

No. 2 Southern foundry, Birmingham	$10.50
No. 1 Northern foundry, New York	$15.50 to 15.75
No. 2X Northern foundry, New York	15.00 to 15.25
No. 2 Plain, Northern foundry, New York	14.75 to 15.00
No. 2 Northern foundry, Chicago	14.50 to 15.00

OLD IRON.

Conditions could hardly be worse; consumers are rejecting almost everything. Quotations are almost wholly nominal and it is possible that on a firm offer, prices would be materially lowered. Quotations for New York delivery are as follows:

No. 1 yard wrought, long	$10.50 to $11.00
No. 1 yard wrought, short	9.75 to 10.00
Heavy-melting steel scrap	9.75 to 10.00
Machinery cast	10.00 to 10.50
Wrought pipes and tubes	9.50 to 10.00
Malleable castings	10.00 to 10.50
Wrought turnings	5.50 to 6.00
Cast boring	5.00 to 5.50
Stove plate	8.00 to 8.50
Light iron	4.00 to 4.50

COPPER.

The market is dull and there is very little business. Foreign buyers are not purchasing on account of the unrest in Europe, and American consumers are beginning to curtail their requirements. It looks as though the price of copper would recede further. Wholesale lots of electrolytic are held at 12.25 to 12.50 cents and Lake at 12.50 cents.

LOWER PRICES FOR TIN.

The large arrivals of tin during the last few weeks have resulted in lower prices being named for spot tin and sales have been made at 37.45 cents. An item of particular interest was the Banca sale, which went at 39.30 cents, c. i. f. (cost, insurance and freight), New York, and which was fully 1½ cents above the spot price. This indicates that there is still an interest in London. The arrivals of tin during September were extremely large, amounting to over 5,200 tons. Consumptive requirements are not as large as two months ago.

LEAD.

Prices are lower, outside interests asking 4.47½ cents New York, and 4.37½ cents St. Louis, but the American Smelting & Refining Co. continues to quote shipment lead in 5-ton lots at 4.50 cents New York.

SPELTER.

Prices are again lower and wholesale lots of prime Western spelter are for sale at 6 cents New York and 5.85 cents St. Louis.

MILWAUKEE NEWS.

The contract for making test borings for the proposed new intake, to be constructed at an estimated cost of $850,000, has been awarded to the Gray Water Supply Co., Milwaukee, by City Engineer Joseph A. Mesiroff. The council has appropriated $6,000 for the work. There will be four borings on shore, three 40-ft. deep and one 160-ft. deep. The two borings in the lake will be 160-ft. deep each and will be 2,000 and 4,000 ft. from shore.

Bids for the sewers to be built by Milwaukee County on each side of the Grand avenue viaduct in the town of Wauwatosa, have been opened by the county board. The lowest bid submitted was that of George Crilley for $13,201.

Harry E. Briggs, commissioner of public works, Milwaukee, has called for and is receiving bids for constructing sewers in the south and west sewer districts. The contracts for the south district amount to about 3,000 ft. of 12-in. pipe sewer, 1,600 ft. of 15-in. pipe sewer and the necessary manholes and connections. About 2,200 ft. of 12-in. 1,000 ft. of 15-in., 2,800 ft. of 18-in. pipe sewers and manholes with necessary connections, will be constructed in the west sewer district.

NEWS FROM OHIO.

Akron.—The city council at a recent meeting voted to authorize the issue of $160,000 bonds to purchase real estate and a right of way for a new water-supply for the city. It is proposed to secure the water-supply in the future from the Cuyahoga River near Kent, O. A portion of the amount will be used in the building of large reservoirs. The next step will be to authorize the issuance of $815,000 bonds for the purchase of the plant of the Akron Water Works Co., a private corporation, which is now supplying water to the city.

Lorain.—The Lane-Bowen Co., of Elyria, has offered to install sanitary closets and do all of the plumbing in the new school building to be erected, for $3,075.85. The firm may receive the contract.

Columbus.—Bids will be received October 13th by H. S. Holton, director of public service, for 250 tons of cast-iron pipe for the use of the water-works department. Bids are wanted for the delivery of the pipe where it is needed and also f. o. b. cars.

London.—At the November election a vote will be taken on the question of authorizing $20,000 bonds for a central heating-plant to furnish heat to all of the school buildings of the city.

Columbus.—For the third time bids for the erection of public-comfort stations in Gooddale Park ran too high for the appropriation, and the plans will again be revised.

Alliance.—Fitzpatrick & Hoepfner, of Columbus, O., have been awarded the contract for plumbing, heating and ventilating the school building to be erected.

Columbus.—The Weinman Pump Mfg. Co. has been awarded the contract to equip a number of deep wells at Oak Harbor, O., with electrically-driven pumps for the water-supply of the village.

Careful! Careful!

A bank lately received the following note from a lady: "Please stop payment on the check I wrote out to-day, as I accidentally burned it up."

PACIFIC COAST LETTER

San Francisco.

A matter of general interest to the jobbing trade is the announcement by the transcontinental railroads of a general increase in class rates on west-bound freight, to go into effect November 1st. This is believed to be a fore-runner of an advance on all descriptions of freight brought to this coast by rail, which is expected to have a radical effect on the shipment of goods from inland points. Some change in the handling of west-bound merchandise has been expected for some time, as a combined result of the approaching completion of the Panama Canal and recent rulings of the Interstate Commerce Commission. The change will tend to throw all lines of heavy merchandise to the water route, and may tend to shut some manufacturers in the middle west out of this market. The water route for plumbing fixtures has already been tried for some time with gradually increasing success, and the time required for delivery now compares very favorably with that of the rail shipments. The shipping companies are now able to bring most plumbing fixtures through in very satisfactory shape, and while shipments of pipe, sheets, etc., frequently arrive in poor condition, these difficulties are rapidly being overcome.

San Francisco plumbers have enjoyed a very fair summer season, and with the opening of fall the volume of work seems to be increasing. One of the principal features is the letting of contracts on large public buildings. Aside from those already let, figures are to be taken soon on the new Polytechnic High School, and on a number of court-houses and jails in country towns. Locally, a general quickening in the building trades is expected as a result of the municipal election this week. James Rolph, jr., who won the mayoralty by a large majority, is one of the city's leading business men, and has the confidence of practically all business interests in the city. It is believed that large investments of capital, which have been held back pending the outcome of the election, will be announced immediately and that all classes of business will benefit therefrom.

Plans and specifications for the varied building and engineering projects which will be a part of the Panama-Pacific Exposition are now being prepared by the commissioner of public works and practically every firm on the coast will bid on one or more of the contracts to be awarded.

Bids for the installation of equipment at the City and County Hospital were opened by the Board of Public this week, the lowest being as follows: Boilers and boiler auxiliaries, John G. Sutton & Co., $49,800; laundry machinery and water-pipe for tunnel, Central Electric Plumbing & Heating Co., $19,450; ice-making plant, Vulcan Iron Works, $12,889; plumbing and gas-fitting, Wittman-Lyman Co., $5,974; sterilizing plant, Dundon Iron Works, $2,500. Contracts will be awarded this week.

A plan proposed by Health Officer McNutt to establish public drinking-fountains and public-comfort stations at about two dozen points throughout the city, was approved by the board of health this week and a recommendation for the necessary appropriation will be made.

The Robert Dalziel, jr., Co. will in the near future begin the installation of a heating-plant in the new building of the Knights of Columbus at the corner of Golden Gate avenue and Leavenworth street. The contract price is $9,000. The same firm is installing plumbing in the Alcazar theater at a cost of $6,000 and in the new Masow-Morrison building at the corner of Market and Battery streets at a cost of $3,000. Another contract which they are fulfilling is the installation of plumbing in the municipal pumping-station at the corner of Second and Townsend streets.

The well known firm of Duffey Bros. is now entirely out of the plumbing business and is attracting considerable attention in the automobile world through its aggressive methods in pushing to the front the motor-truck for which it has been appointed agent in this territory. Prior to the fire of 1906, this firm was one of the largest plumbing concerns in the field and handled some very large contracts, specializing on work of considerable magnitude. Following the fire this work was again taken up but later the wholesale field was invaded and for quite a time a large business was done. Several months ago this business was closed out and the agency for a motor-truck taken.

Willard C. Chamberlin, manager of the Pacific Coast interests of the Standard Sanitary Mfg. Co., is now in the southern part of the state on a business-trip but will be back by the first of the month.

William S. Snook & Son have been awarded the contract for the installation of the plumbing system in the Bankers Investment building now in course of erection on Market street, just above Kearny, the consideration mentioned being $12,950. This is to be a four-story store and office structure, but provisions are being made for the addition of other stories later on if needed. The heating work in this structure will be done by John G. Sutton & Co., the price mentioned in the contract being $4,060.

James E. Britt, formerly one of the best known master plumbers in the state, and at one time president of the state association, has severed his connection with the Mark-Lally Co., with which he has been since giving up the plumbing business, and is now filling a position with the N. O. Nelson Mfg. Co.

The Royal Heating Co. is now occupying an entire two-story building on Minna street, between Third and Fourth, and has added to its equipment placing it in a strong position to compete in the local field.

M. A. Mitchell recently opened a plumbing shop at 1047 Mission St. in one of the largest buildings, as far as ground space is concerned, that has been erected in the downtown district.

The Atlas Heating & Ventilating Co. has been successful in securing the contract for the heating and ventilating work to be done in the Methodist Episcopal church building being erected at Harriet and Howard streets, the contract being valued at about $2,000.

Plans have been completed and bids will be called for shortly for repairs and alterations, including plumbing, to the commanding general's residence at Fort Mason. Plans have also been completed for the construction and equipment of a kitchen building at the Presidio. This work will include extensive plumbing and ventilating work as well as cooling systems.

L. Wagner & Sons' Pacific Copper Works have been incorporated with a capital stock of $20,000 by Marie Wagner, C. W. R. and E. L. Wagner. This firm does considerable work for the plumbing trade.

Plans have been completed for the addition to be made to the St. Francis Hotel and within a short time work will be commenced on the construction of the new wing that is to cost about $1,250,000. This new wing will contain about 365 rooms, these to be arranged in apartments of from three to seven rooms each and to be elaborately fitted up.

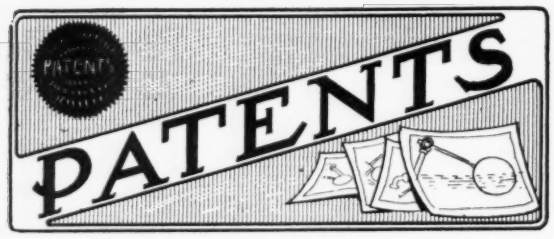
Elsewhere on the Coast.

Red Bluff, Cal.—George Goekler, plumber and tinner, has moved from his former quarters in Main street to offices and a store in the Stoll building opposite the Red Bluff opera-house.

Riverside, Cal.—Bids for furnishing galvanized pipe for playground apparatus were opened by the city clerk this week. The award has not been announced.

Pendleton, Ore.—The contract for installing a heating-plant in the branch asylum for the insane has been awarded to Theodore W. Barr, of Salem, Ore.

San Diego, Cal.—Schultheim Bros., with a bid of $10,473, were the lowest bidders for the contract of installing plumbing in the county jail and Harry Hubbs, $1,850, was the lowest bidder on the steam-heating contract for the same building. Bids were opened by the board of supervisors last week, but the announcement of the award of contracts has not yet been made.



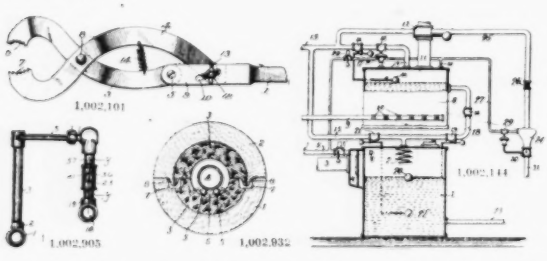
Heating Department.

1,002,101. Pipe-Wrench. Oscar J. Watts, Kensington, Kans. A wrench comprising a bifurcated handle, an oppositely curved lever, the longer curved portion being pivoted to the end of the bifurcated handle, and the shorter portion terminating in a serrated jaw, a similar lever arranged with its jaw opposite the jaw of the first-mentioned lever and connected thereto by a pivot, a coil spring connecting the longer curved portions of said levers and adapted to close said jaws, the sides of the bifurcated handle being provided with diagonally extending slots, and a bolt extending through said slots and the end of the second-mentioned lever, substantially as described.

1,002,144. Water-Heating Apparatus. George H. Gibson, Montclair, N. J., assignor to Harrison Safety Boiler Works, Philadelphia. The combination of a water-heater, means for supplying steam and water thereto, a second water-heater, means for supplying steam thereto, a connection between said heaters, means operated automatically when the level of the water in the second heater falls to a predetermined point for opening said connection, and means operated automatically when the level of the water in the second heater falls to a lower point for supplying water to the second heater from a source other than the first heater, substantially as set forth.

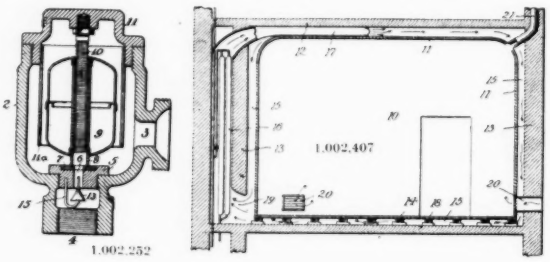
1,002,905. Humidifying Apparatus. Albert J. Dronsfield, Providence, R. I. In a device of the type set forth, the combination with the vaporizer and the water inlet member, of a fluid inlet member opening into the vaporizer adapted to admit fluid under pressure to the vaporizer, and means in the fluid inlet member for automatically checking the flow of the fluid to the vaporizer at a determined pressure of the fluid.

1,002,932. Pipe-Covering. Glendon A. Richards, Grand Rapids, Mich., assignor to Richards-Wilson Pipe Covering Co., Grand Rapids, Mich., a corporation of Michigan. A pipe-covering comprising an outer waterproof case divided longitudinally and an integral lining of heat insulating material having an axial opening therethrough, and provided with a groove in one part and a tongue in the other part and pipe supports at intervals to support a pipe in the axis of the opening and spaced apart from the lining.

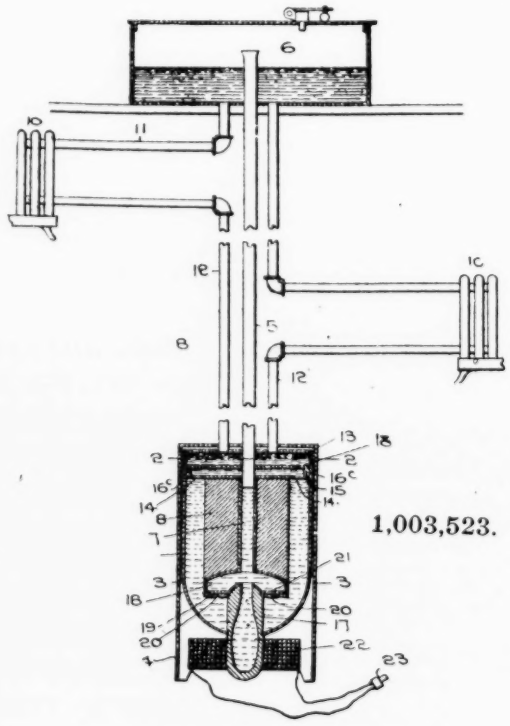


1,002,252. Automatic Valve for Steam Apparatus. James Logan Fitts, Merchantville, and John E. G. Montgomery, Camden, N. J., assignors to Warren Webster & Co., a corporation of New Jersey. In a steam-fitting, the combination of a body having inlet and outlet ports separated by a transverse partition provided with a central orifice through it, a check valve adapted to seat upon the discharge side of the orifice and consisting of a cup-shaped piece of very light weight having its closed end presented to the orifice, and a support for the cup-shaped check valve piece consisting of a wire fastened into the transverse partition to one side of its orifice and bent inward over the open end of the valve piece to limit its movement away from the orifice

1,002,407. Heating and Ventilating System. Carl Kleinschmidt, Brussels, Belgium. A heating and ventilating system for dwelling apartments with separate heating air and breathing air, comprising a room having a surrounding air space which is out of communication with the room, air-heating means located exteriorly of said room, means for connecting the air spaces along the ceiling and floor of the room with said heating means to produce a circulation of the heating air whereby said air is caused to descend in the air spaces along the room walls, means for introducing breathing air near the room floor, and means for discharging the heated and ascending foul breathing air at the room ceiling, thereby preventing a redescending of said foul air and an intermixing thereof with fresh breathing air.



1,003,523. Heating System. Benjamin F. Seymour, Denver, Colo. In a system of the class described, an element comprising a vessel divided horizontally by a perforated partition, a core in the lower portion of the vessel spaced from its wall and having an internal cavity, means for establishing communication between the lower portion of the vessel and the said cavity, an upright water-conduit connected with the said cavity, a receptacle connected with the conduit at its upper end, a radiator, pipes connecting the latter with the receptacle and with the upper portion of the said element, a valve adapted to control the communication between the interior of the lower portion of the said vessel and the cavity in the core, and a valve adapted to close the orifice of the pipe which connects the radiator with the upper portion of the vessel.



Plumbing Department.

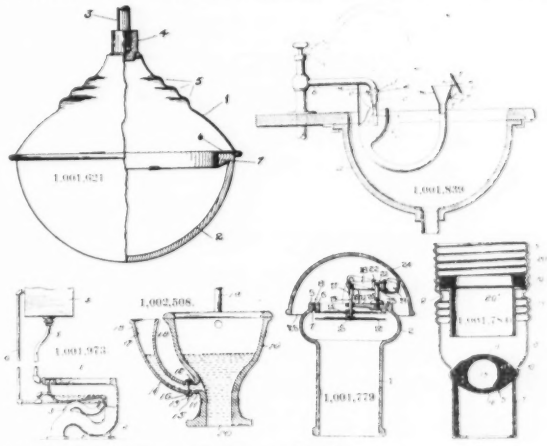
1,001,621. Tank-Valve Ball. Louis A. Cornelius, Grand Rapids, Mich. A hollow air-tight valve ball comprising cup-shaped portions, and an annular connecting member for said portions, of separate piece therefrom, and having a flange embracing the peripheral edge of one said portion and another flange embracing the peripheral edge of the other said portion and turned in the direction opposite to that in which the member's first flange is turned, such member in transverse section thus assuming the shape of a distorted letter S.

1,001,779. Air-Inlet for Traps. Bernard E. Slack, Medina, N. Y., assignor to Medina Foundry Co., Medina, N. Y., a corporation of New York. In a device of the class described, a tubular body having oppositely extending lugs at its upper end, a ring removably mounted on said body and also having oppositely extending lugs fitted on the lugs of said body, a beam rockably mounted above said ring and carrying a counterweight, a disc valve operatively arranged below the ring, and a vertical arm loosely hung from the beam and connected at its lower end to the disc valve.

1,001,784. Water-Filter. James Frank Stocking, New York, N. Y. A filter including an attaching casing having a nozzle, said casing having an internal shoulder, a pipe arranged axially in the casing and having a terminal flange bearing upon said shoulder, a perforated disc closing the bore of said pipe and bearing with its marginal portions upon said flange, said disc reinforcing against distortion at its juncture with the pipe, and a yielding gasket bearing upon said disc and wall of the casing and clamping said disc to said flange.

1,001,839. Sanitary Drinking Apparatus. Albert E. Garland, Boston, Mass. In a sanitary drinking-apparatus, a receptacle adapted to be pivotally sustained by a faucet in position to receive water therefrom, a drinking-cup, a tubular connection between said receptacle and cup adapted to sustain the latter in position for use, a cover hinged to the cup, and a stop or rest intermediate of the cover and cup and adapted when the cup is in position for use to support the cover at one side of the cup, said cover when the apparatus is reversed by swinging it in a vertical line over upon the faucet being adapted to swing under and close said cup.

1,001,973. Water-Closet. Isaac C. Miller and David F. Hott, Cincinnati, O. In a water-closet, a bowl, a main



trap, a supplementary trap, a flushing tank, a connection between said flushing tank and said bowl, a pipe leading from said flushing tank and connecting with said bowl and with the supplementary trap.

1,002,508. Cuspidor Attachment for Closets. William H. Faust, Chico, Cal. A closet-bowl having a neck formed on one side thereof, an annular flange on the outer end of said neck, a supplemental bowl, said bowl having an elongated curved neck, an annular flange on the end of said neck, each of said flanges having openings adapted to register when engaged, bolts passed through said open-

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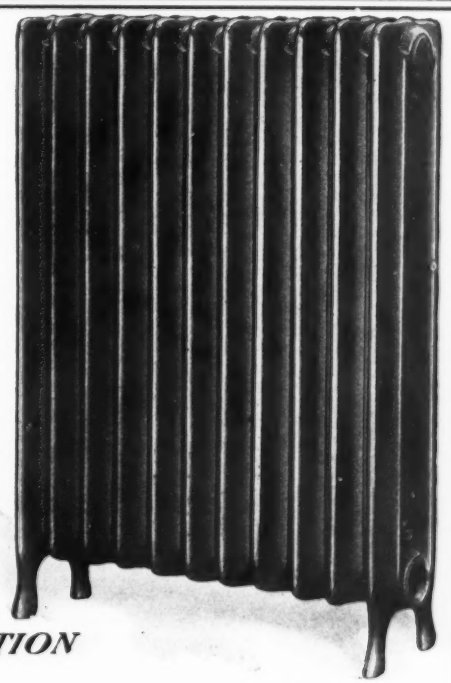

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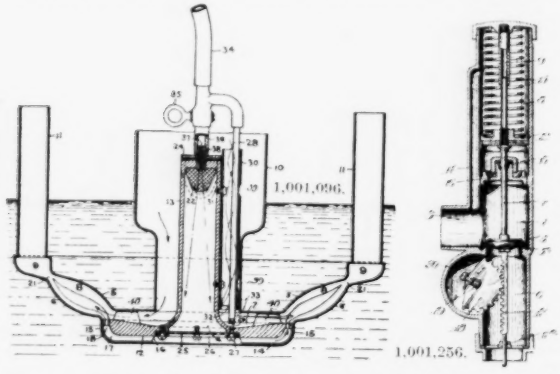
ings, a gasket between the flanges, whereby the supplemental bowl is attached to said neck, said supplemental bowl extending upwardly to a point on a level with the first named bowl, and external threads on the first-named annular flange, whereby a cap may be screwed on to the first-named flange, when the auxiliary bowl is removed to close the opening in the said first-named neck.

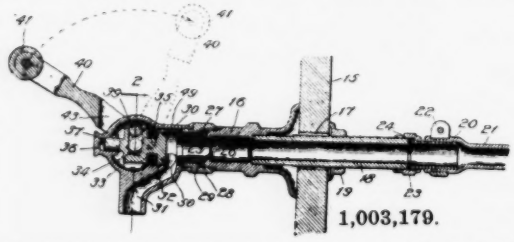
1,001,096. Water Heater. Harry E. Townsend, New York, N. Y. In a water-heater, the combination of a casing and a burner centrally arranged therein, said casing consisting of upper and lower members of disc-like contour, joined at their outer edges and elsewhere spaced



apart to provide therebetween a space for the burner and a combustion space and being upwardly inclined from the burner to their outer circumferences, a central downdraft flue, and escape flues communicating with the said combustion space.

1,001,256. Pressure Flush-Valve. Joseph F. Diaz, San Francisco, Cal., assignor of one-half to Paul Salina, San Francisco, Cal. The combination, of a cylinder having a transverse partition dividing it into a plurality of chambers, one of said chambers having an inlet, a valve-seat in said last named chamber having an opening through which water is discharged from the cylinder, a valve adapted to close against said seat, a plunger operable in the chamber of the cylinder above the partition, a stem connecting the valve and plunger so that they operate together in the same direction, a spring in the chamber above the partition and bearing against the plunger, said partition having a restricted opening through which water is allowed to escape slowly during the descent of the plunger and valve, whereby the valve seats slowly, and a by-pass having one portion connecting with the chamber in the cylinder above the plunger and having another portion connecting through said inlet with the chamber in the cylinder below said partition.

1,003,179. Faucet. Frank Gruschow, Chicago, Ill., assignor to the Imperial Brass Mfg. Co., Chicago, Ill., a corporation of Illinois. In a faucet, a cylindrical packing-member, a flange at one end thereof, a short length



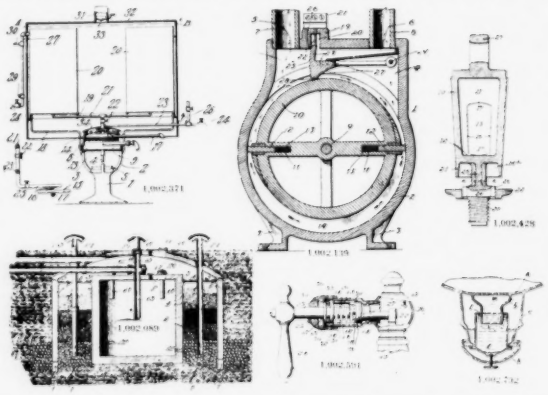
of tube within said packing-member, a shoulder on the outside of said tube against which the flange abuts, an outer sleeve adapted to clamp the flange to the said shoulder, the opposite end of the packing-member projecting to form a radially yielding valve seat, a reciprocating valve-member with an annular groove adapted to engage said seat, and means for reciprocating said valve-member located on the opposite side thereof from its grooved face and adapted to seat the valve-member toward the discharging fluid.

1,002,371. Water-Heater. Ida Florence C. Curtis, Dayton, O. In a water-heater, the combination with a burner, of a tank thereabove, a water-coil supported above the burner, a feed-pipe extending to the coil from a source of supply and from said coil to the tank, a valve within said pipe connections between the coils and the tank for controlling the passage of water from the coil to the tank, a pipe extending from said connection between the coil and the valve for conveying water to the point of use from the source of supply and the coil when the valve is closed and from the tank when the valve is opened.

1,002,139. Water-Meter. Alonzo S. Drisko, Boston, Mass. In a device of the character described the combination of a casing, a drum rotatably mounted therein, blades seated in recesses formed within the drum, means for yieldingly forcing the blades into engagement with the casing, a plate hingedly secured within the casing and operatively engaged by the blades, and a link secured to the said plate for the purpose of operating a suitable registering device adapted to be mounted adjacent the casing.

1,002,428. Iron-Body Cock. Philip Mueller, Decatur, Ill., assignor to H. Mueller Mfg. Co., Decatur, Ill., a corporation of Illinois. In a ground-key cock, a hollow tapered turning plug having a relatively thin wall and an imperforate flat floor at a right angle to the axis of the plug, said wall being formed with fluid openings therethrough of less height and width than the chamber in said plug, said openings having flat sides and curved tops and bottom on the same radius as the fluid passages of the cock body into which said plug is adapted to fit, the bottoms of the fluid passages being in line with the floor of the chamber in the plug.

1,002,089. Cesspool. Conrad Christian Sofleiss, Richmond Hill, N. Y. An apparatus for the purpose set forth comprising an inner closed receptacle, means for discharging material into the same, an outer receptacle sur-



rounding said inner receptacle, a perforated plate supported by and between the upper ends of the said receptacles, a filtering-bed between said receptacle below said plate, air-supply tubes leading to the bottom of said filtering-bed, an air-escape tube leading from the top of the outer receptacle, and outlets leading from the top of the inner receptacle and terminating immediately over the said perforated plate.

1,002,591. Self-Closing Cock. Frederick F. Lecuyer, Salt Lake City, Utah, assignor of one-half to Fred W. Spencer, Salt Lake City, Utah. A self-closing cock having a casing, a valve, a turnable stem for the valve, a spring surrounding the stem, a disc fixed to the stem having one end of the spring secured to it, and a second disc loose on the stem and fixedly secured to the other end of the spring, said loose disc having radial lugs projecting from its periphery, and said casing having parallel grooves in its inner walls with which said lugs are interchangeably engaged, and a locking ring loose on the stem having radial lugs projecting from its outer circumference and engaging the grooves in the casing.

1,002,792. Stench-Trap. Bernat Weitzenhoffer, Eperies, Austria-Hungary. A device of the class described comprising an outer casing, having an opening in its bottom, a dip pipe projecting into said outer casing, and a bowl having its upper end surrounding the end of the dip pipe and located above the outlet of the outer casing and means for removably holding the bowl in the opening in the outer casing.